

CDC PUBLIC HEALTH GRAND ROUNDS

Tracking Environmental Health Data for Public Health Decision Making



June 21, 2016



U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

Creating a Network for Action: Environmental Public Health Tracking Program



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Acting Lead, Science Development Team

Environmental Health Tracking Branch

Division of Environmental Hazards and Health Effects

National Center for Environmental Health



U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

Understanding How Our Environment Affects Our Health



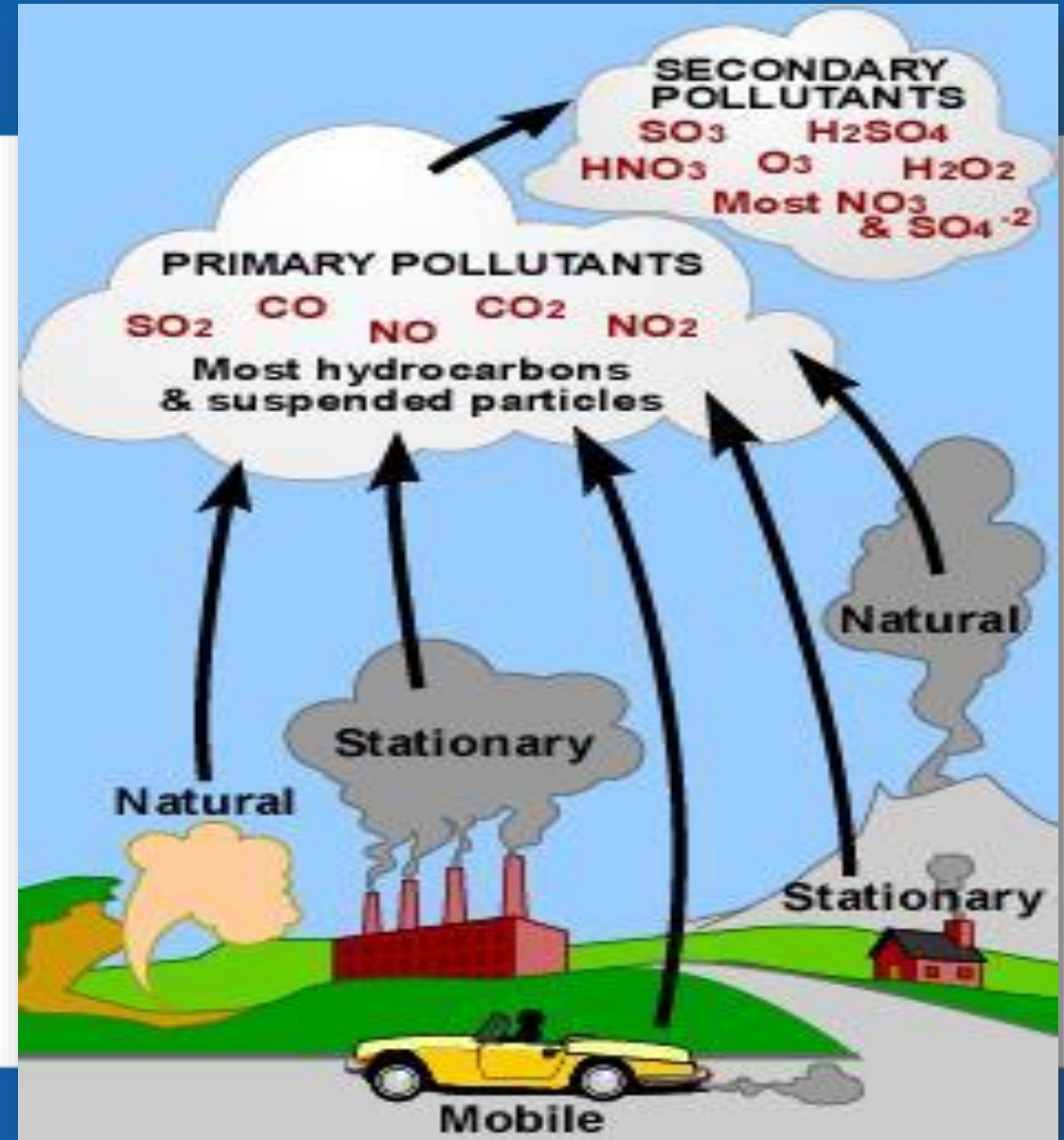
- **Environmental health is part of public health**
- **Focuses on understanding the relationship between people and their environmental exposures**
- **Environmental hazards**
 - Can be chemical, physical, or biological factors
 - Found in air, water, communities, and surroundings

Outdoor Air Pollutants

➤ EPA Criteria Air Pollutants:

- Particulate matter (PM)
- Ozone (O₃)
- Carbon monoxide (CO)
- Sulfur oxides (SO_x)
- Nitrogen oxides (NO_x)
- Lead

➤ Science-based guidelines used to develop national air quality standards

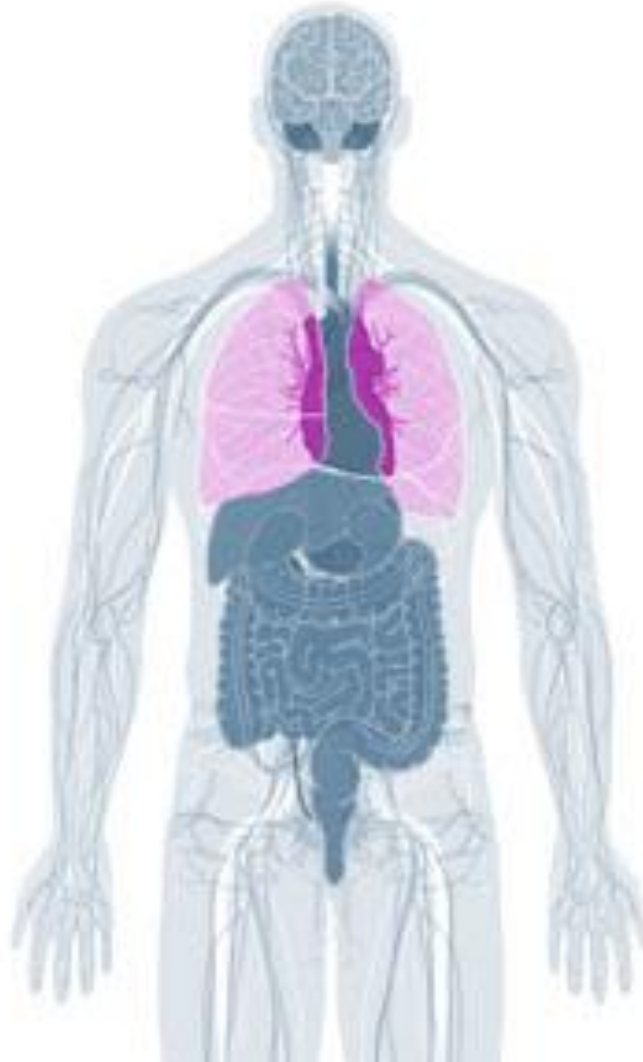


Air Pollution and Health

Cardiovascular



Respiratory



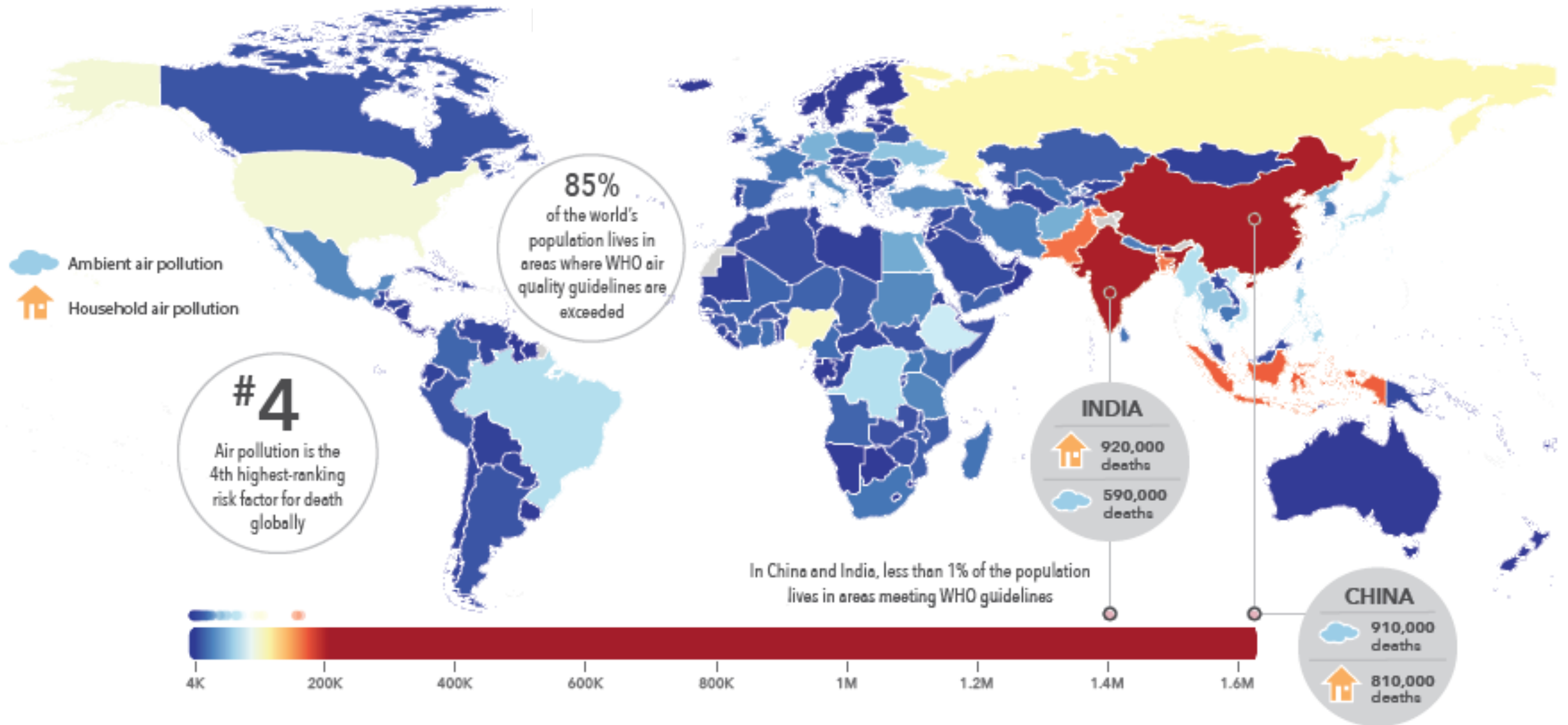
Reproductive Outcomes



Central Nervous System



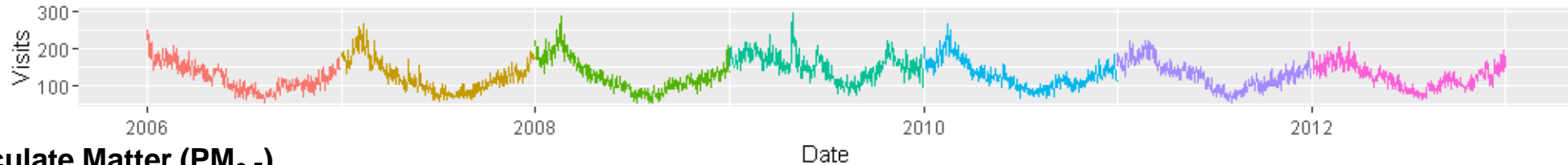
Deaths from Air Pollution in 2013



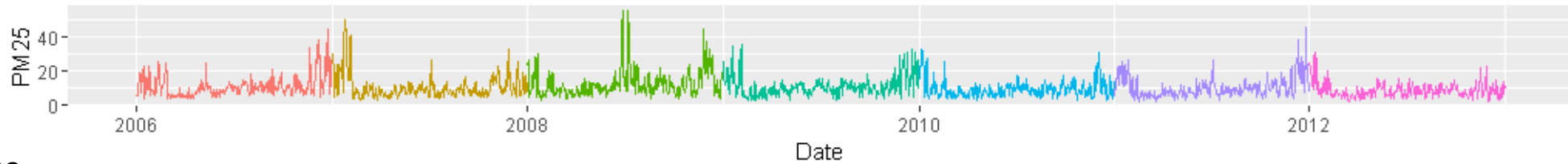
Air pollution was responsible for 5.5 million deaths in 2013

Studies Have Made An Association Between Air Pollution and Health Outcomes

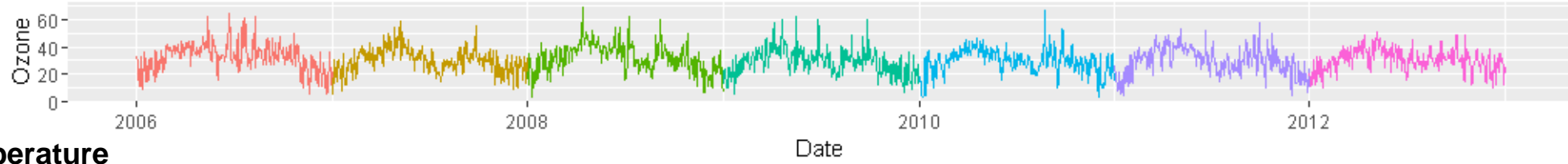
Emergency Department Visits



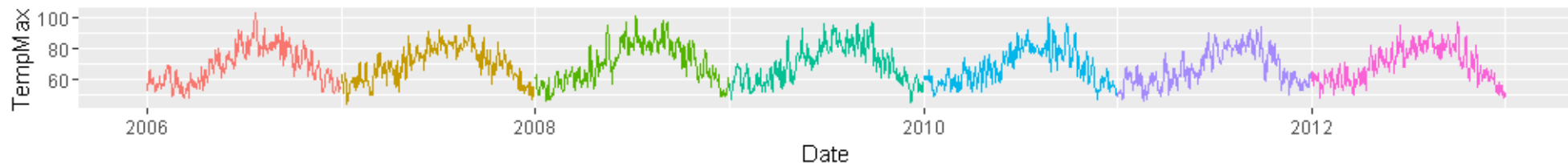
Particulate Matter (PM_{2.5})



Ozone



Temperature



EPA Needs Better Study Results To Inform Standards

➤ **Currently standards rely on studies that are**

- Multi-city with populations over 65
 - ❑ Medicare data
- Single city studies with all ages, or
- International

➤ **Estimates could be more robust by including studies that have**

- Multiple U.S. cities and all ages
- Sensitive populations



Gaps in Air Pollution Data



Map View



Chart View



Table View



About These Data



Need Help?

View Query Panel >>

Annual average ambient concentrations of PM_{2.5} in $\mu\text{g}/\text{m}^3$



Print

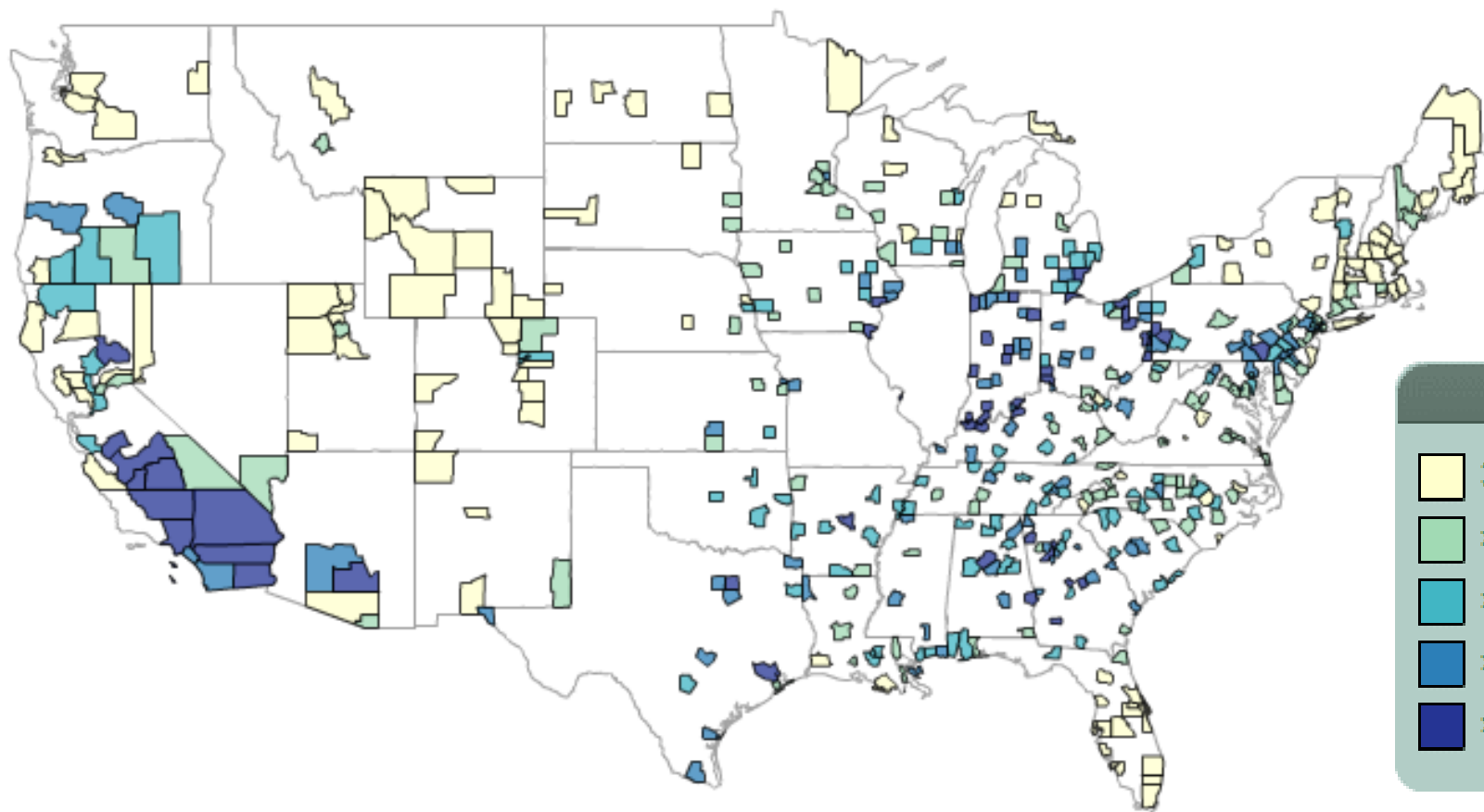


Share

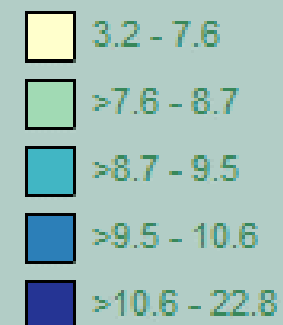


CSV

Options & Info +



Legend

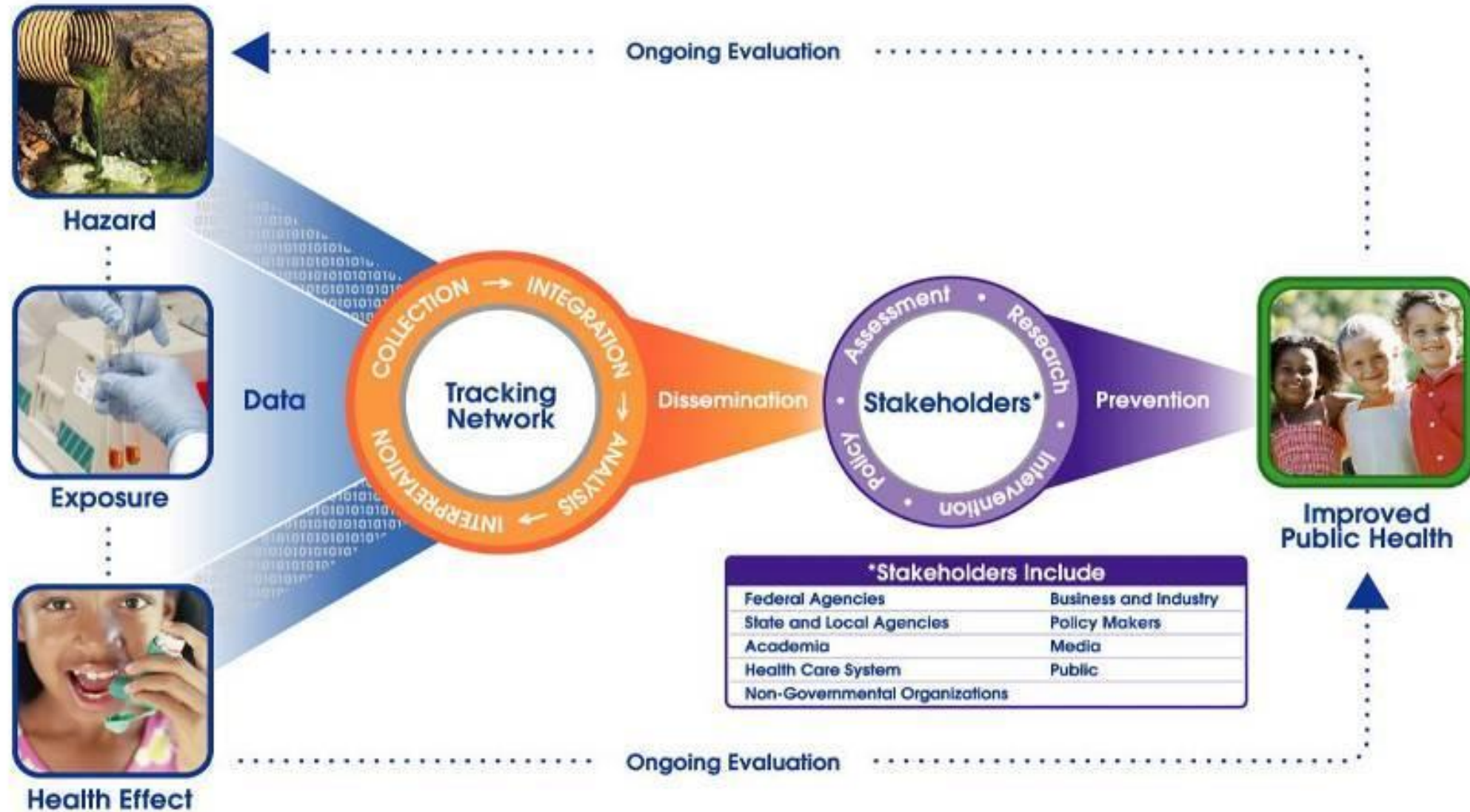


PEW Environmental Health Commission: America's Environmental Health Gap

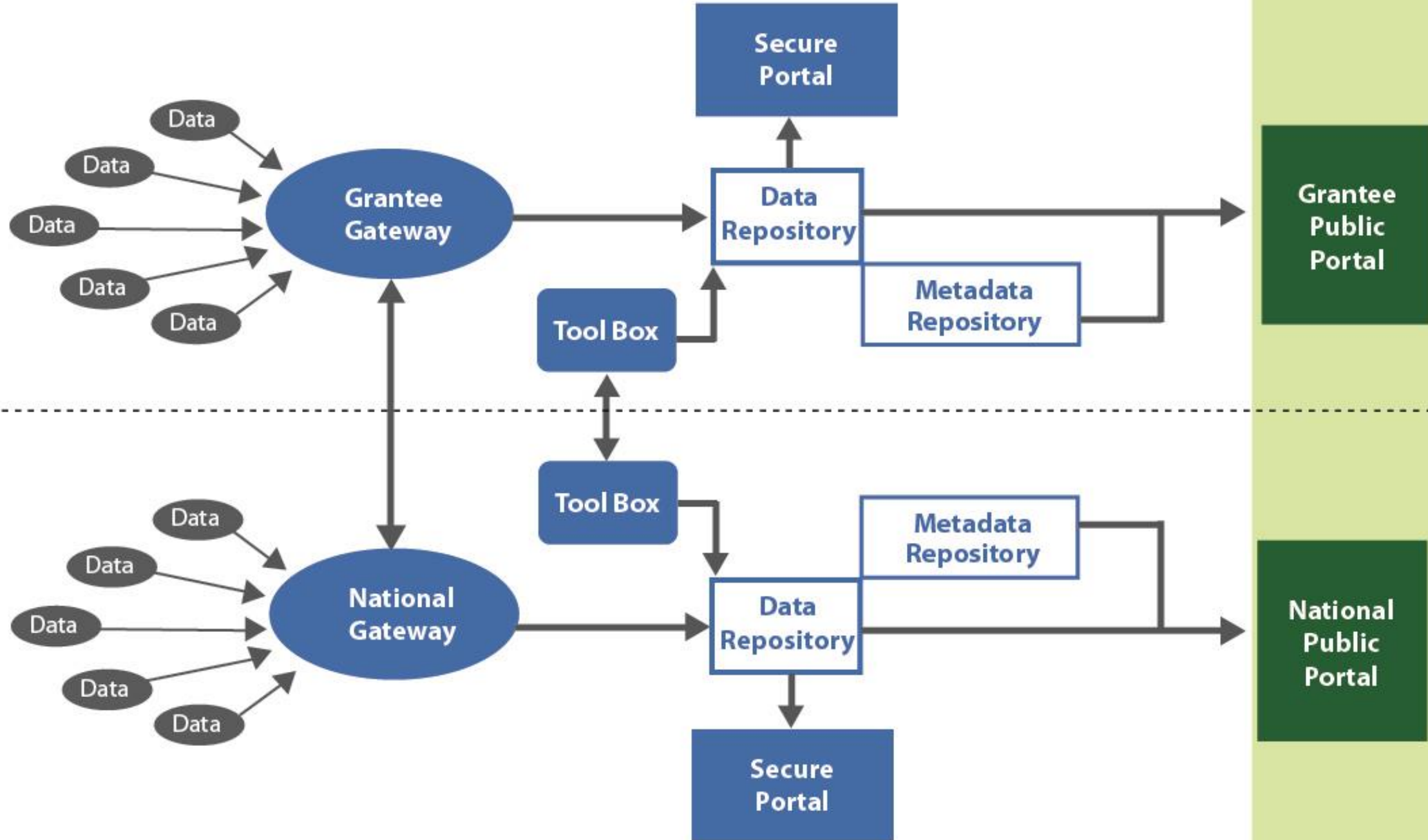
- Little information was routinely collected on non-infectious disease
- Environmental hazard data and monitoring conducted for regulatory purposes, not public health
- Little data on human exposure to environmental hazards
- Answers needed about the role of the environment on health outcomes



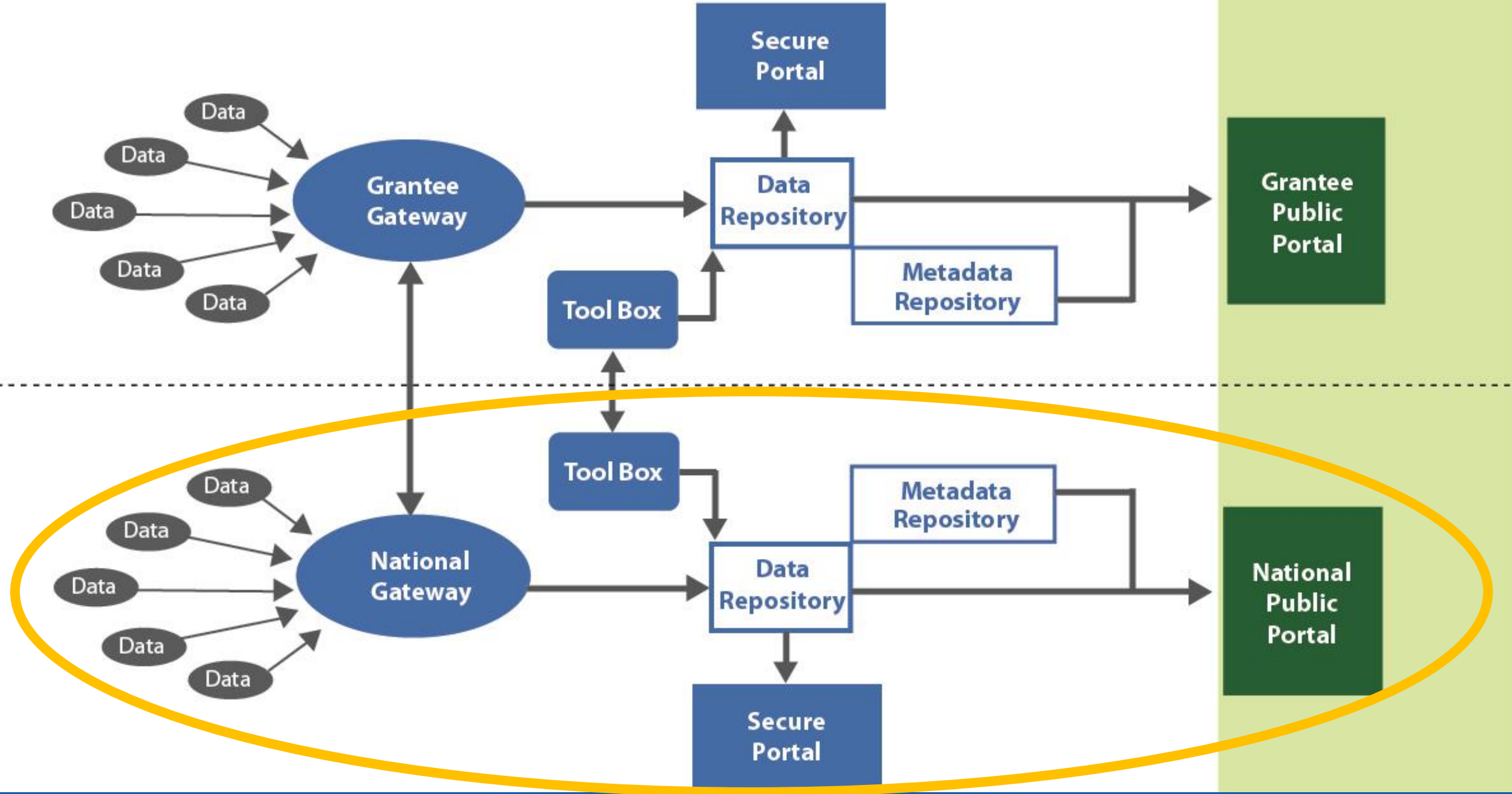
ENVIRONMENTAL PUBLIC HEALTH TRACKING



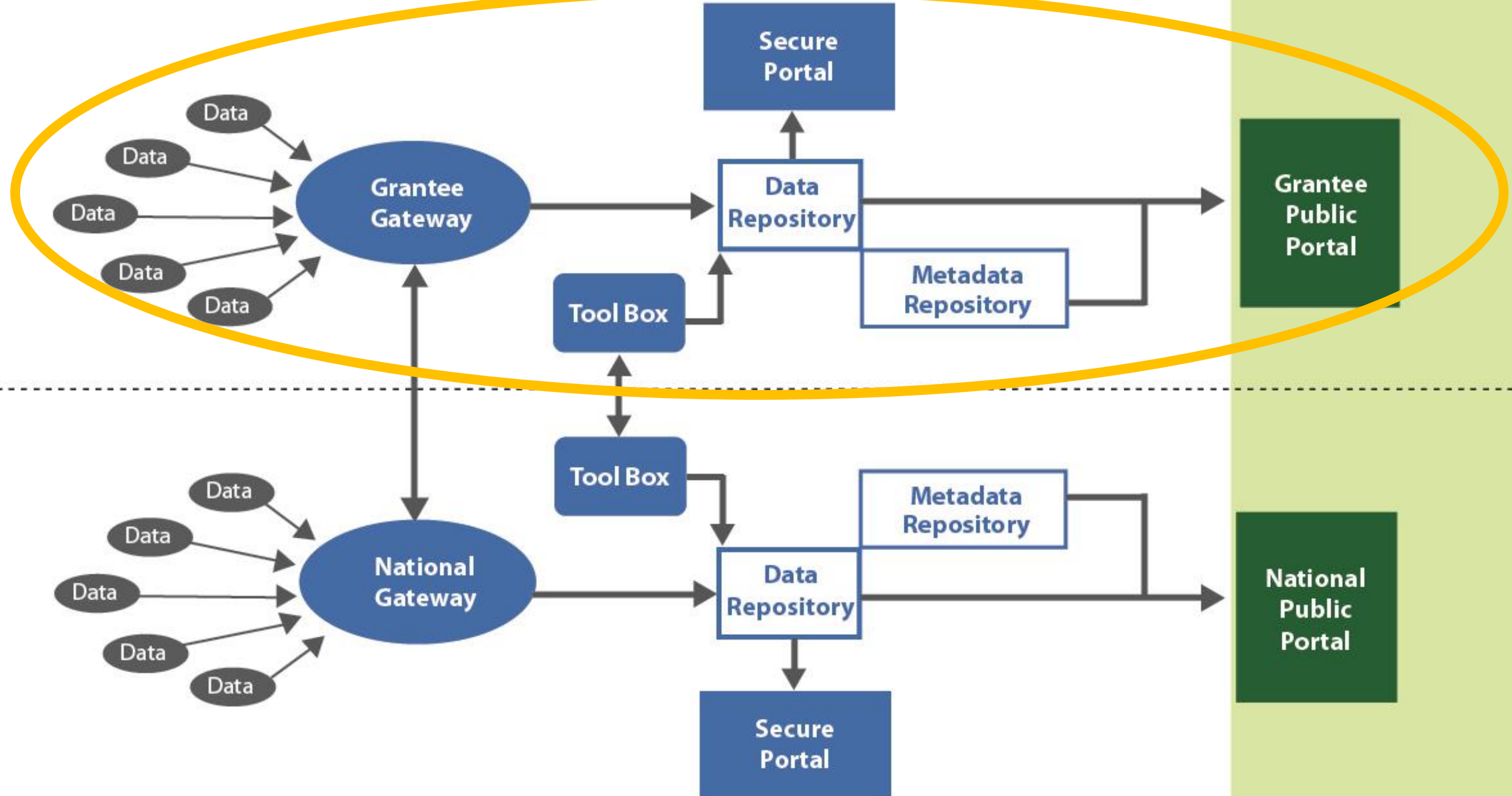
NATIONAL ENVIRONMENTAL PUBLIC HEALTH TRACKING NETWORK



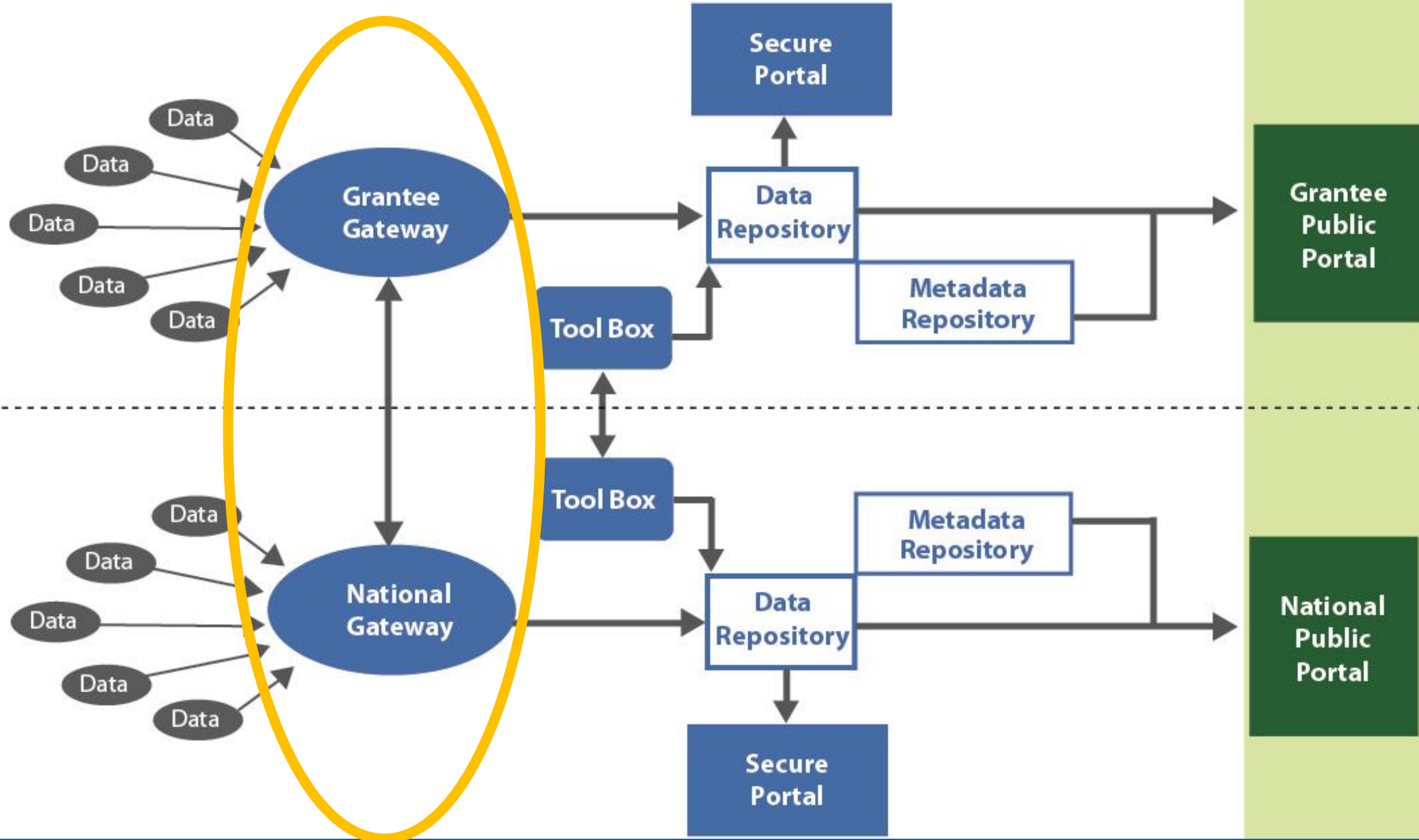
NATIONAL ENVIRONMENTAL PUBLIC HEALTH TRACKING NETWORK



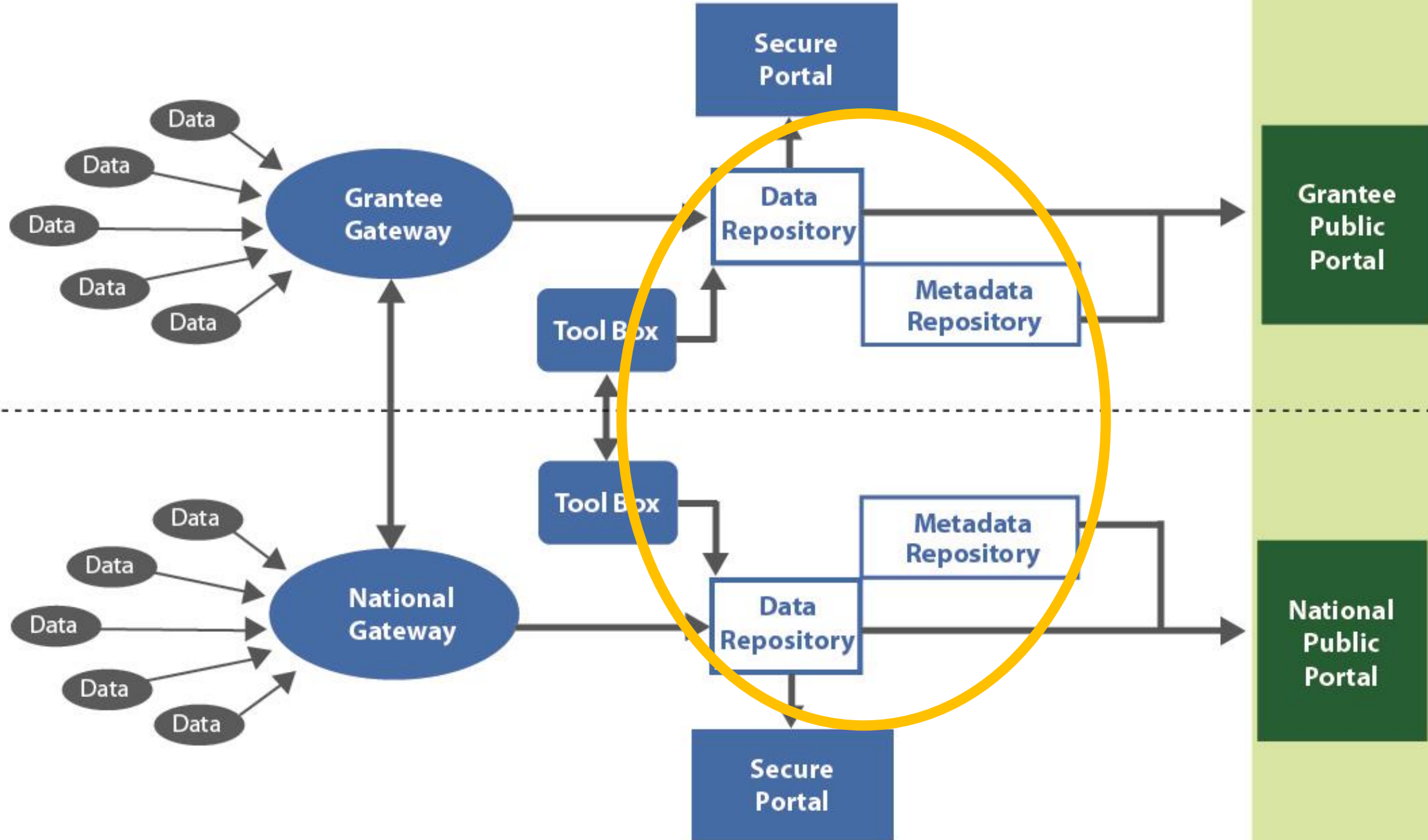
NATIONAL ENVIRONMENTAL PUBLIC HEALTH TRACKING NETWORK



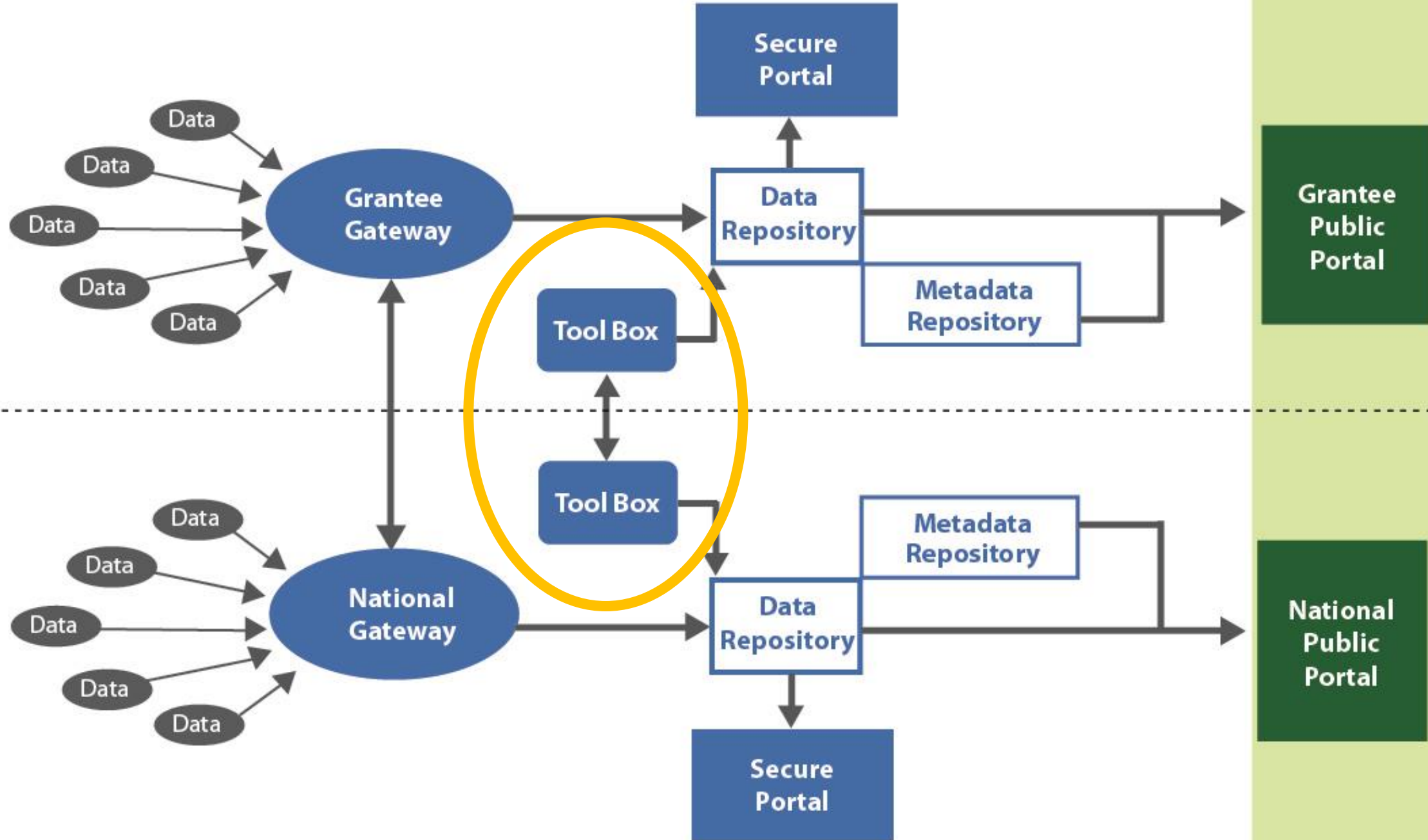
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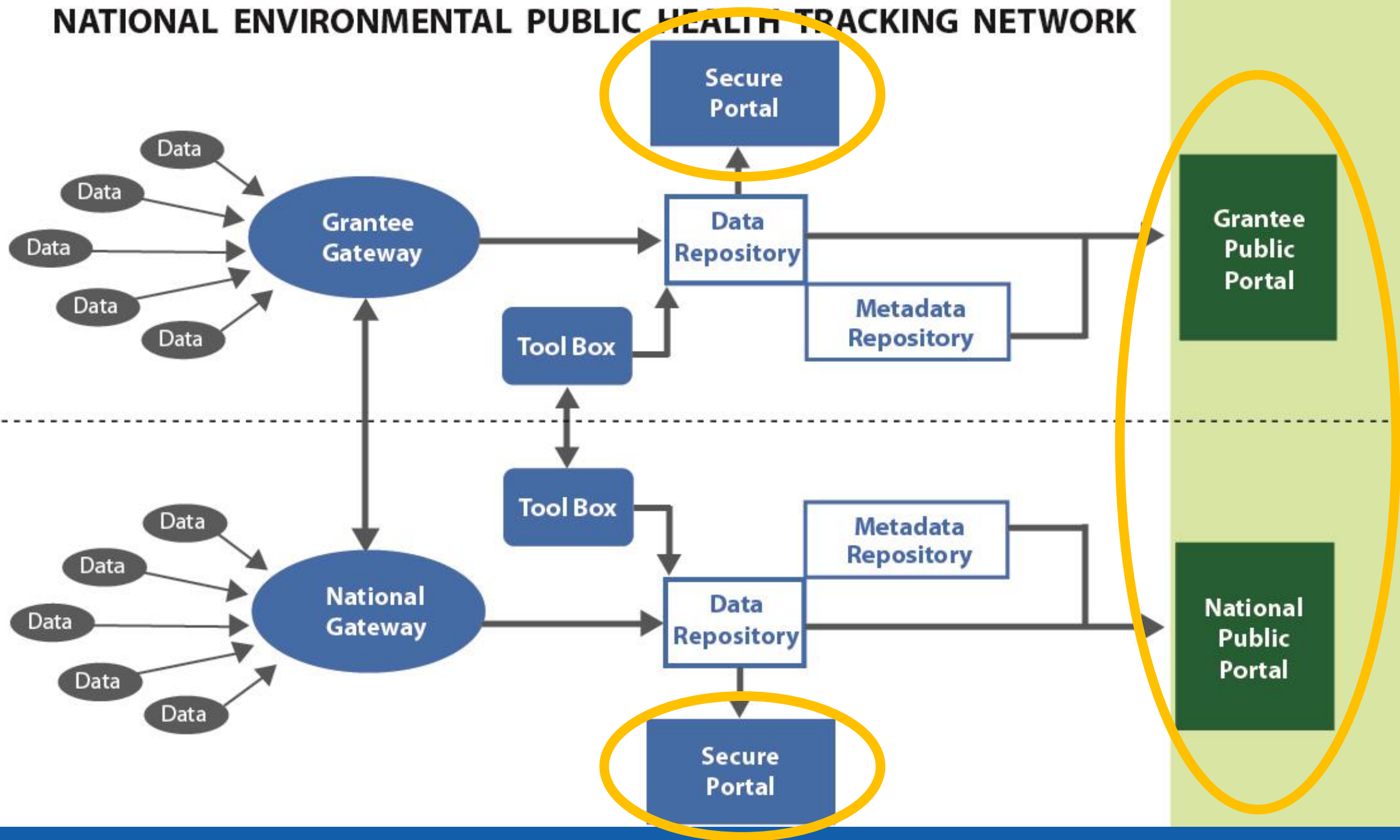
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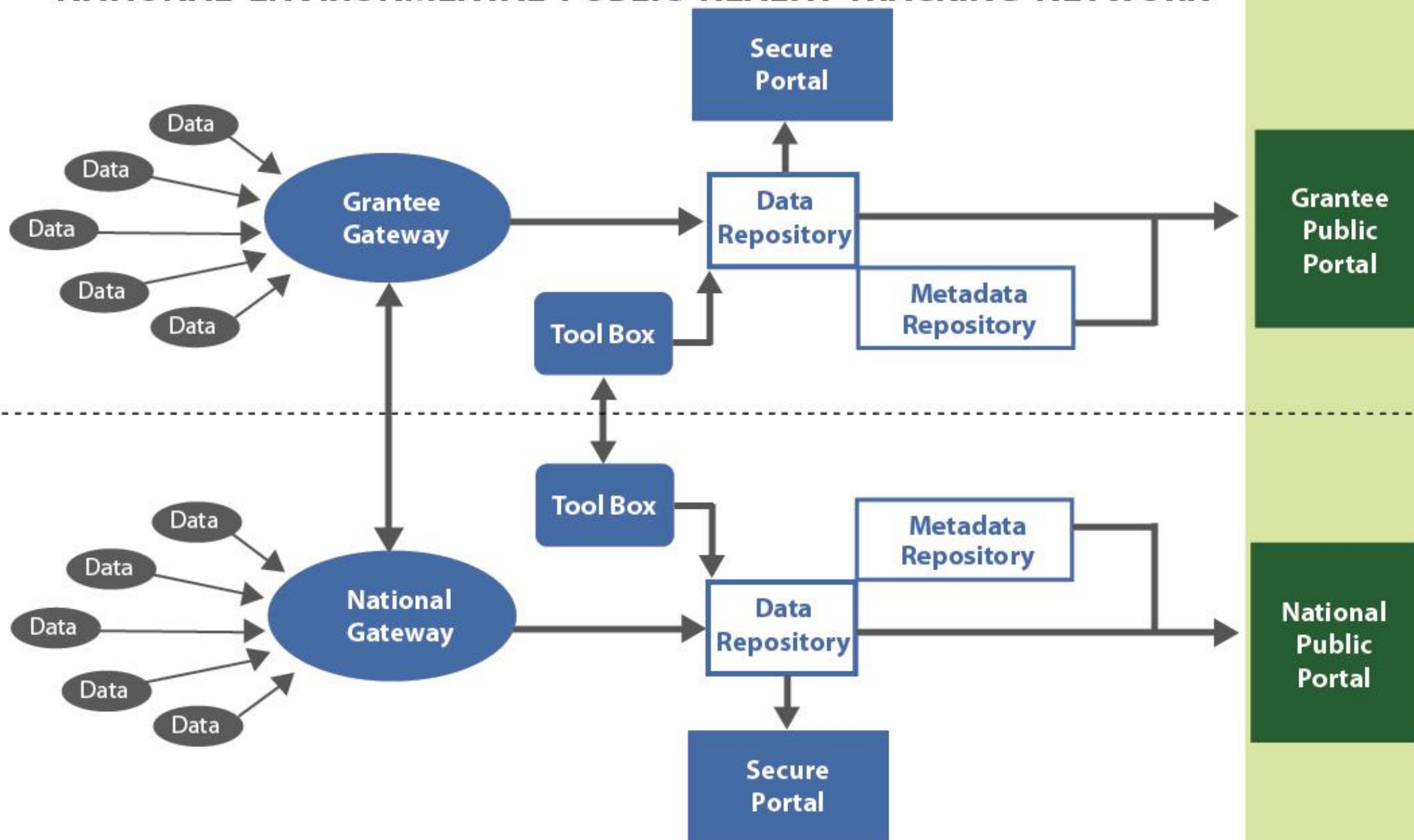
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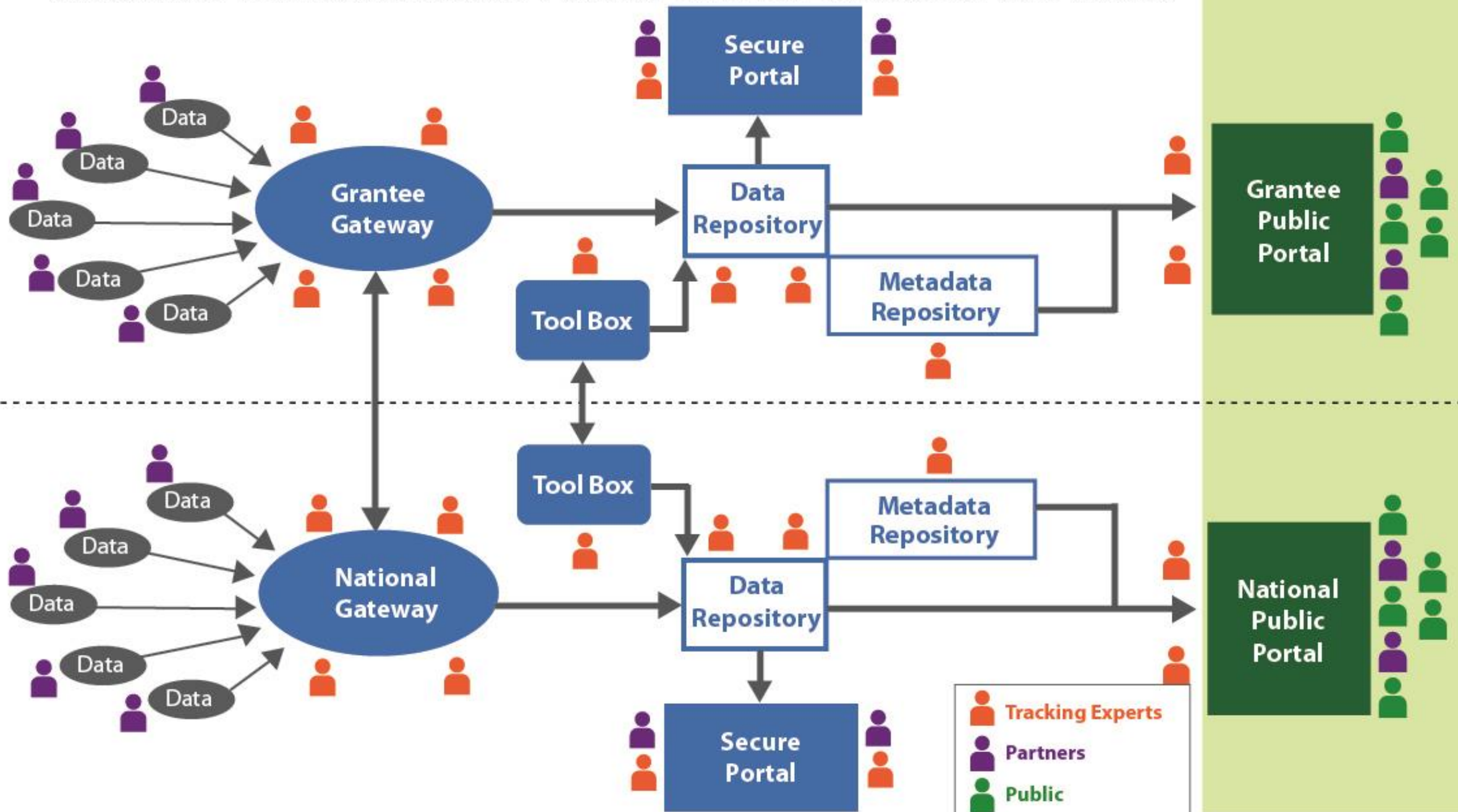
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National Environmental Public Health Tracking Network

Keeping Track, Promoting Health

Environmental Public Health Tracking Classroom Modules Now Available!

- Free
- College-level
- Adaptable and Interactive

The National Environmental Public Health Tracking Network (Tracking Network) is a system of integrated health, exposure, and hazard information and data from a variety of national, state, and city sources.

On the Tracking Network, you can view maps, tables, and charts with data about:

- chemicals and other substances found in the environment
- some chronic diseases and conditions
- the area where you live

[Learn more about the Tracking Network](#)

[Explore Tracking Data](#)

Environments



- Pesticide exposures
- Climate Change **NEW**
- Outdoor Air
- More

Health Effects



- Asthma
- Cancer
- Childhood Lead Poisoning
- More Health Conditions

EXPLORE TRACKING DATA



View & download all data
Maps • Charts • Tables

GO

INFO BY LOCATION



Data for you!
View data by county or zip code

Quick Links

- [Home](#)
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Tracking Hot Topics

- [Tracking Asthma](#)
- [Allergy Testing for Persons with Asthma : FAQs](#)
- [Asthma and Allergy Foundation of America](#)
- [Asthma and Schools](#)
- [National Women's Health Week](#)
- [New Tracking Data API](#)
- [View our Tracking Success Stories to learn how Tracking is making a difference across the U.S.](#)

Explore Tracking Data

Asthma
Biomonitoring
Birth Defects
Cancer
CO Poisoning
Childhood Lead
Climate Change
Community Design
Dev. Disabilities
Drinking Water
Heart Disease
Homes
Lifestyle Risk Factors
Outdoor Air
Pesticide Exposures
Population
Characteristics
Reproductive &
Birth Outcomes
Toxic Substance
Releases

Map View

Chart View

Table View

About These Data

Need Help?

Hide Query Panel

1

2

3

4

* Step 1: Select Your Mode ?

Basic

Advanced

All

Child

* Step 2: Select Your Content ?

Asthma

Emergency Department Visits For...

Age-adjusted rate of emergency ...

Clear Content

* Step 3: Choose Geography & Time ?

All Counties

Arizona

California

Colorado

Connecticut

Florida

Iowa

Louisiana

2006

2007

2008

2009

2010

2011

2012

2013

2014

☒ Show Counties

☒ Apply Smoothing

Clear Geography

Clear Time

Step 4: Advanced Options ?

Advanced Options (Optional)

Gender

Male


Female

Clear Options

* Step 5: Submit ?

Run Query

WARNING: Due to the large size of data to be returned, this query could take a few minutes to complete.



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View our Tracking Success Stories to learn how Tracking is making a difference across the U.S.

25/1

200+

34



Public Health Actions

341

Tracking Grantees

ASTHO Fellows

- City
- County
- State

■ Tracking Grantees

ASTHO Fellows

- City
- ▲ County
- State

Driving Public Health Actions

- **Detect and monitor trends**
- **Identify populations at risk**
- **Identify exposure to hazards**
- **Examine the relationship between hazards and disease**
- **Assess potential disease clusters or exposures**
- **Track progress**
- **Enhance surveillance**
- **Improve access to quality data**

Driving Public Health Actions

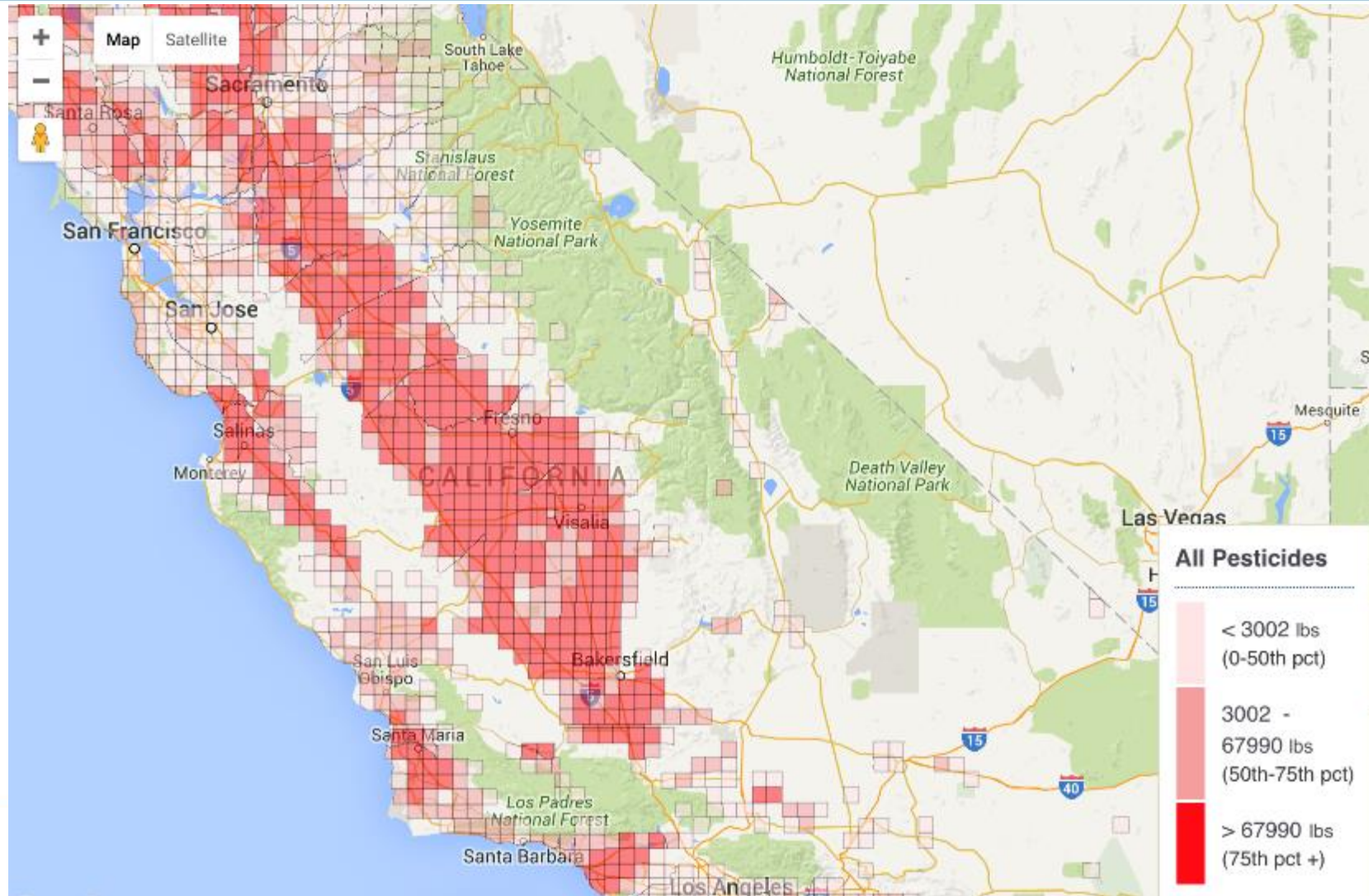
- **Detect and monitor trends**
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- **Assess potential disease clusters or exposures**
- **Track progress**
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- **Improve access to quality data**

**Inform,
improve,
evaluate...**

**programs,
interventions,
policies...**

**to address
environmental
health issues**

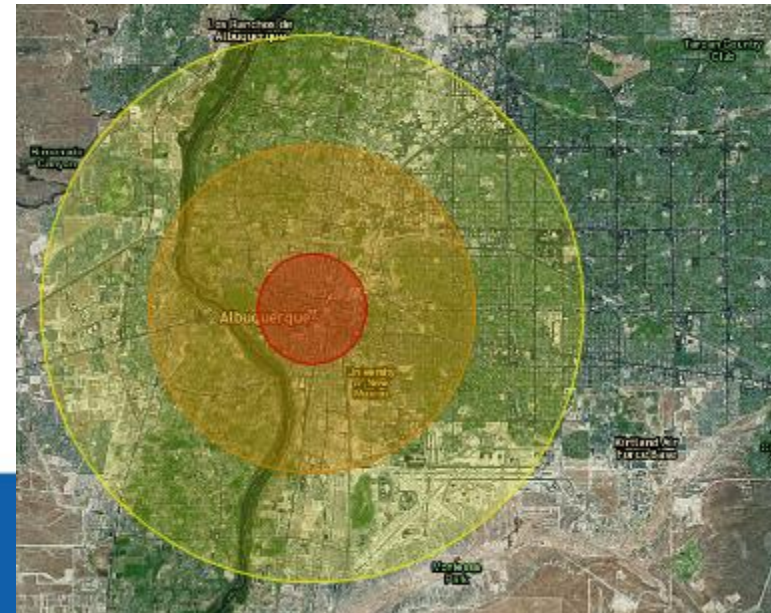
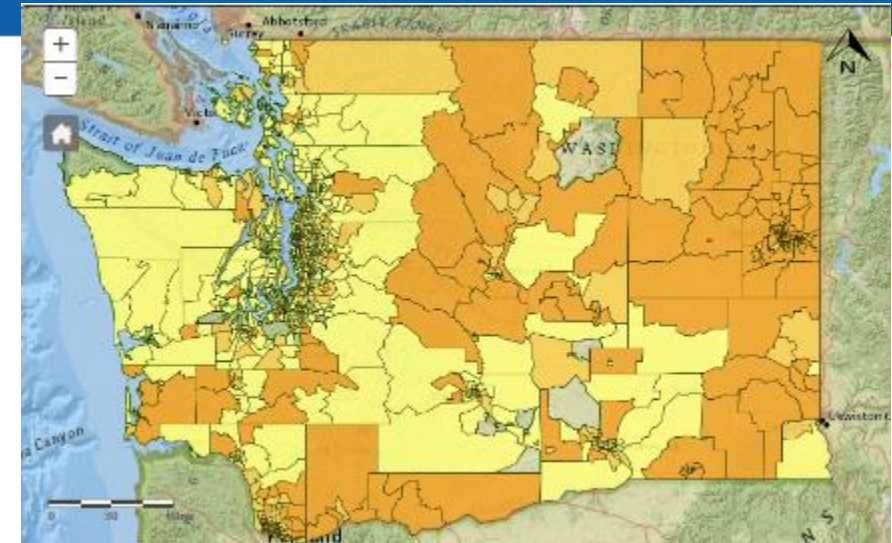
Reducing Pesticides Near Schools in California



Examples of Programs Using the Tracking Network for Action

- Inform blood-lead testing
- Target radon testing outreach
- Warn public of wildfire smoke danger
- Identify local sources of air pollution
- Evaluate transportation plans

Radon
Testing
Outreach,
Washington



Wildfire
Smoke
Danger,
New Mexico

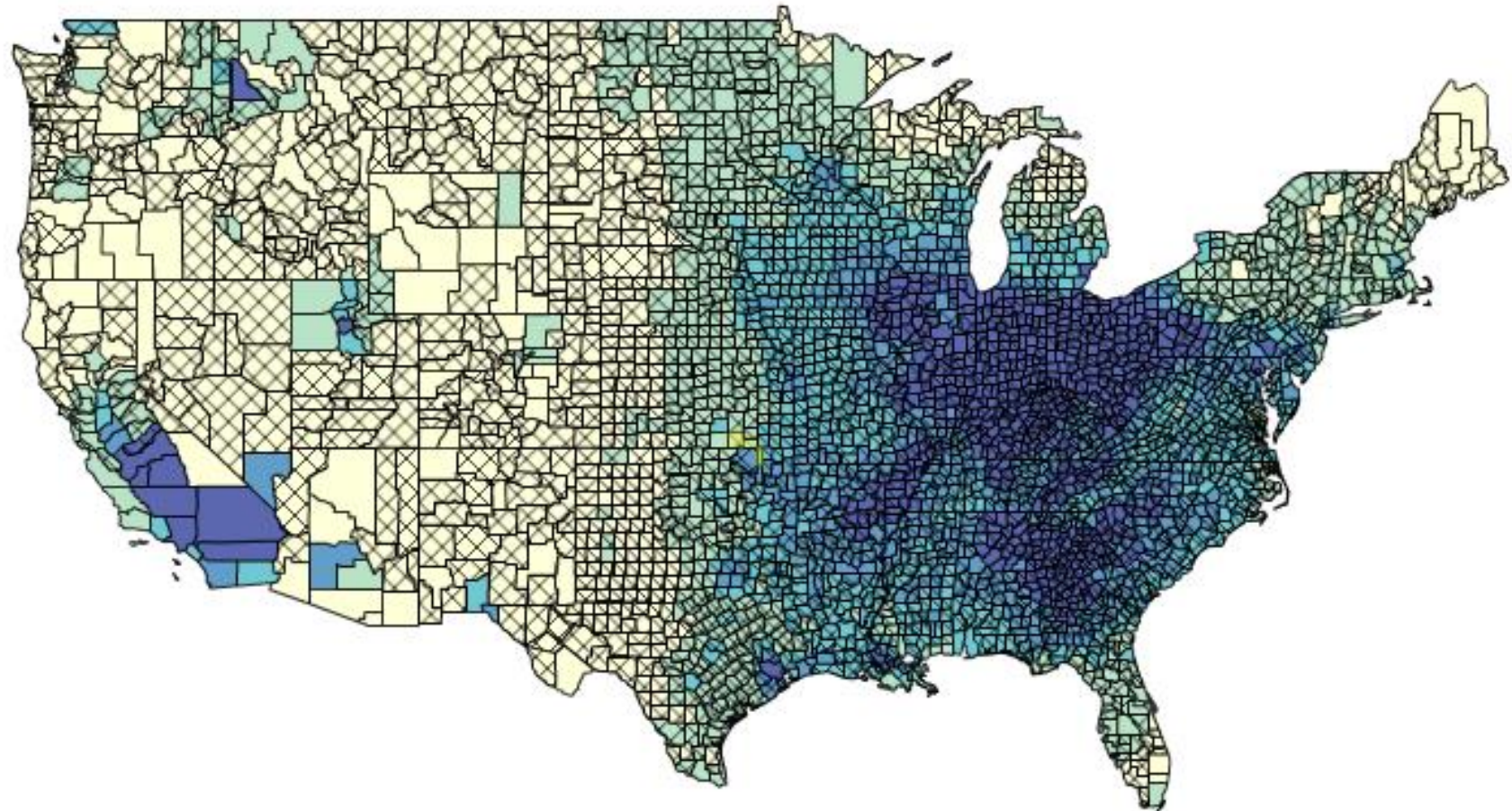
Using Tracking Data and Modeling Tools To Fill the Gaps in Air Pollution Data

 Map View  Chart View  Table View  About These Data  Need Help?

View Query Panel >>

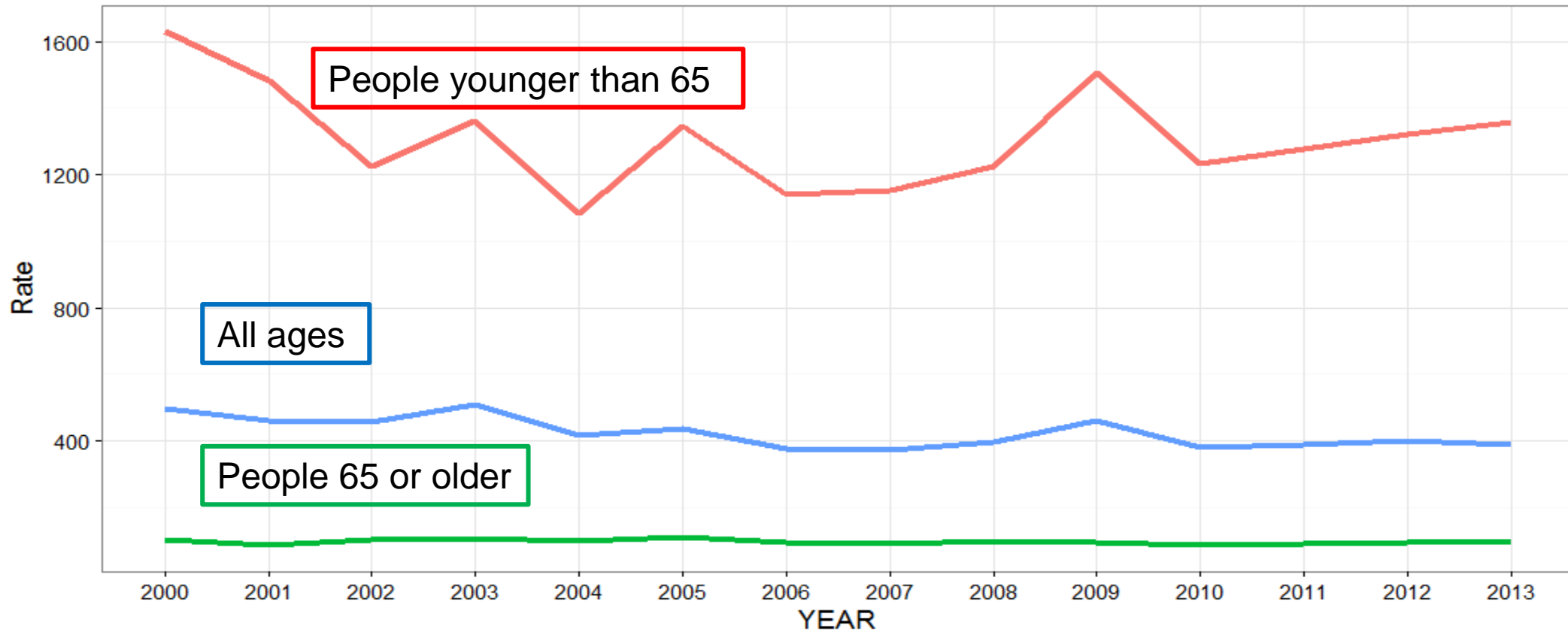
Annual average ambient concentrations of PM_{2.5} in $\mu\text{g}/\text{m}^3$

 Print  Share  CSV Options & Info +



Using Tracking Data To Fill the Gap: Understanding Ozone's Impact on Younger Population

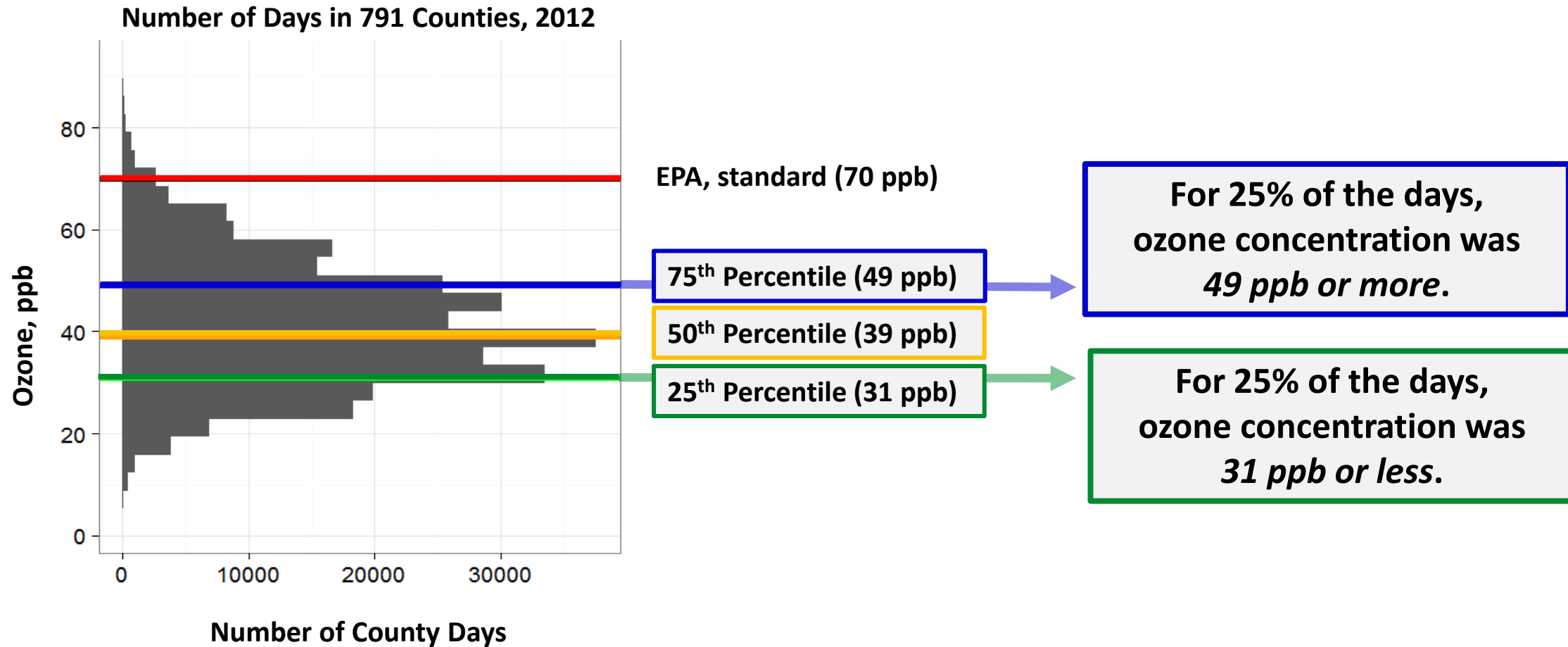
Rate of Respiratory ED Visits per 10,000 Population, 2000–2013



National Environmental Public Health Tracking Network, unpublished data

Filling Gaps in Air Pollution and Health Information

Tracking ED Visits When Ozone Levels Increased

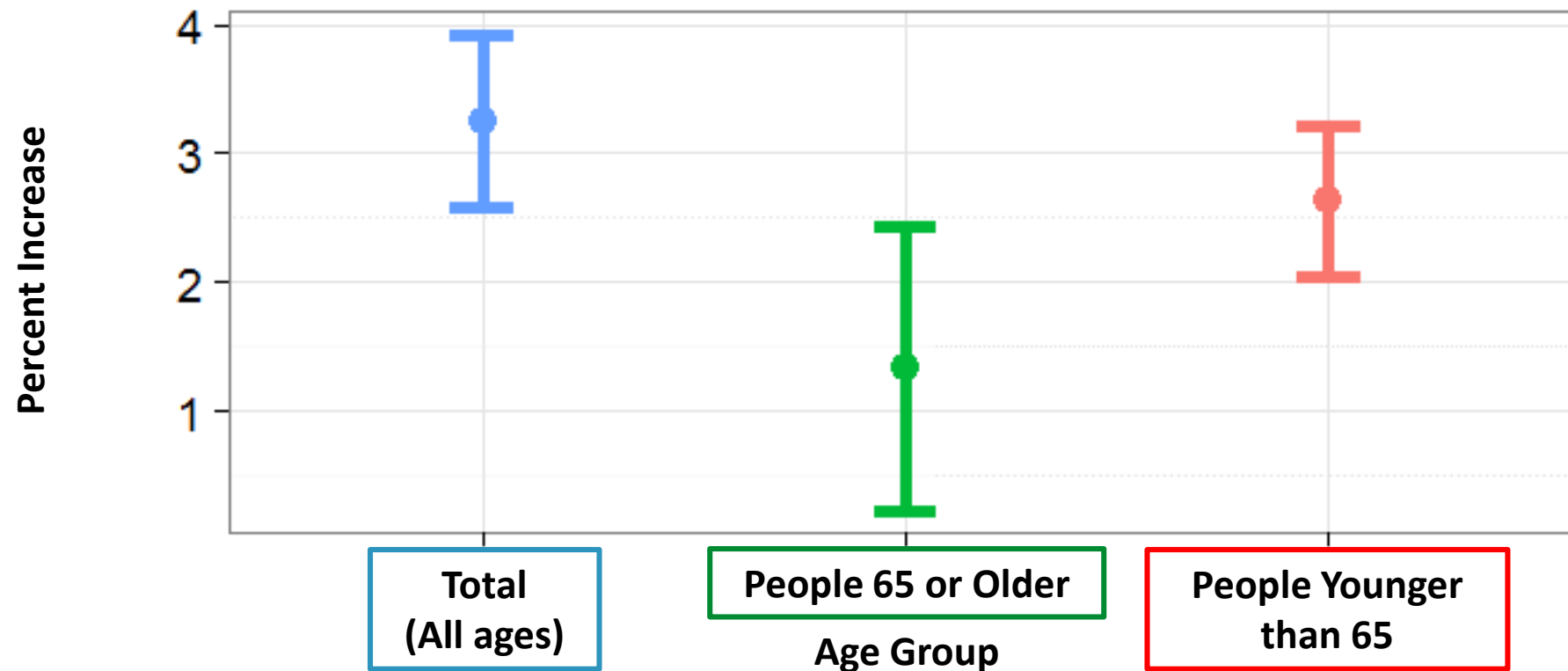


County days: 365 days X 791 counties

National Environmental Public Health Tracking Network, unpublished data

Increased Respiratory ED Visits for 7 Days After Higher Ozone Levels

**Percent Increase in Respiratory ED Visits Over 7-days,
After Ozone at 49 ppb Compared to 31 ppb**



**Almost 80% of
the increase in
visits were from
people younger
than 65.**

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Using Data to Drive Public Health Action in New York City: A Local Health Department Perspective



Wendy McKelvey, PhD, MS

Director, Environmental Health Surveillance and PI, NYC Tracking Program

Bureau of Environmental Surveillance and Policy

Division of Environmental Health

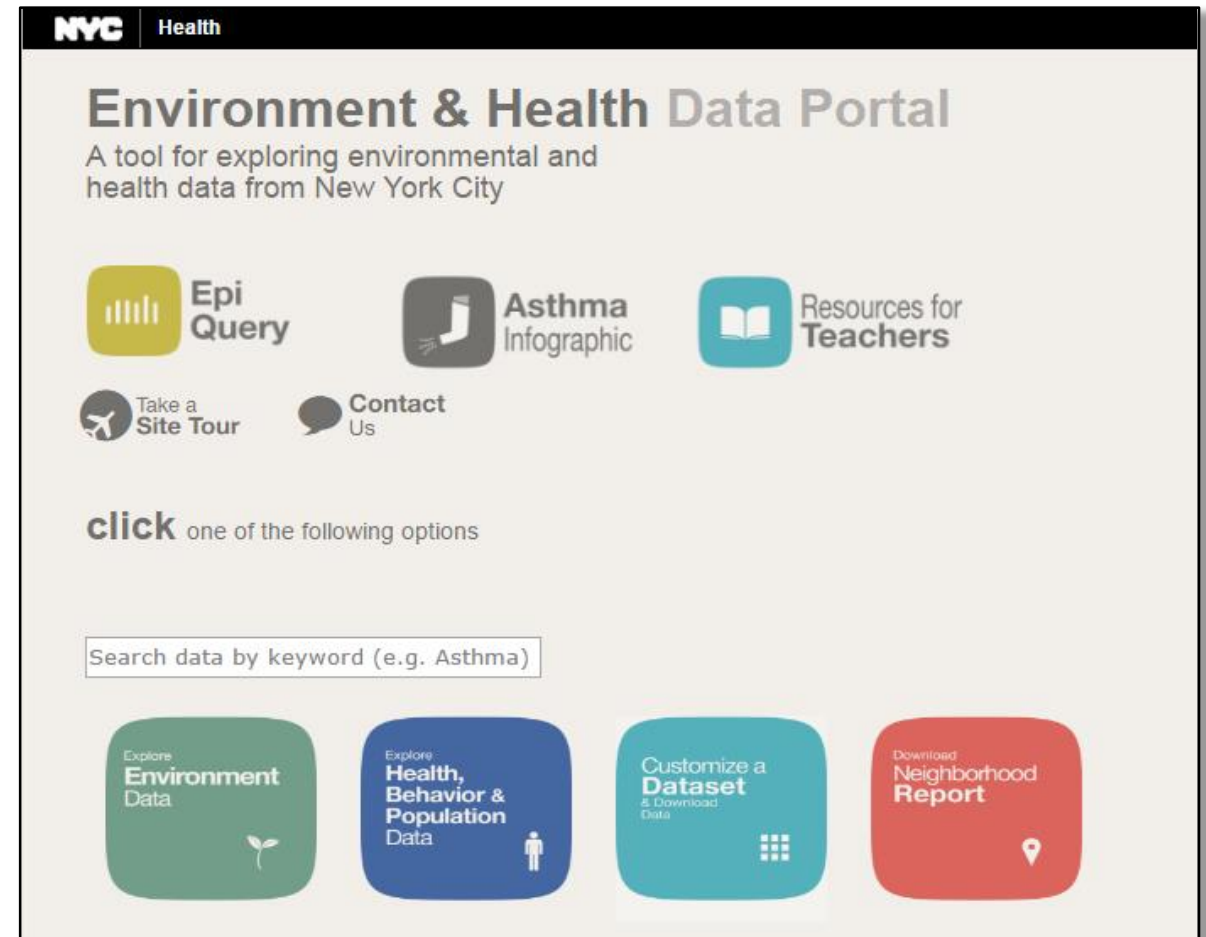
New York City Department of Health and Mental Hygiene



U.S. Department of
Health and Human Services
Centers for Disease
Control and Prevention

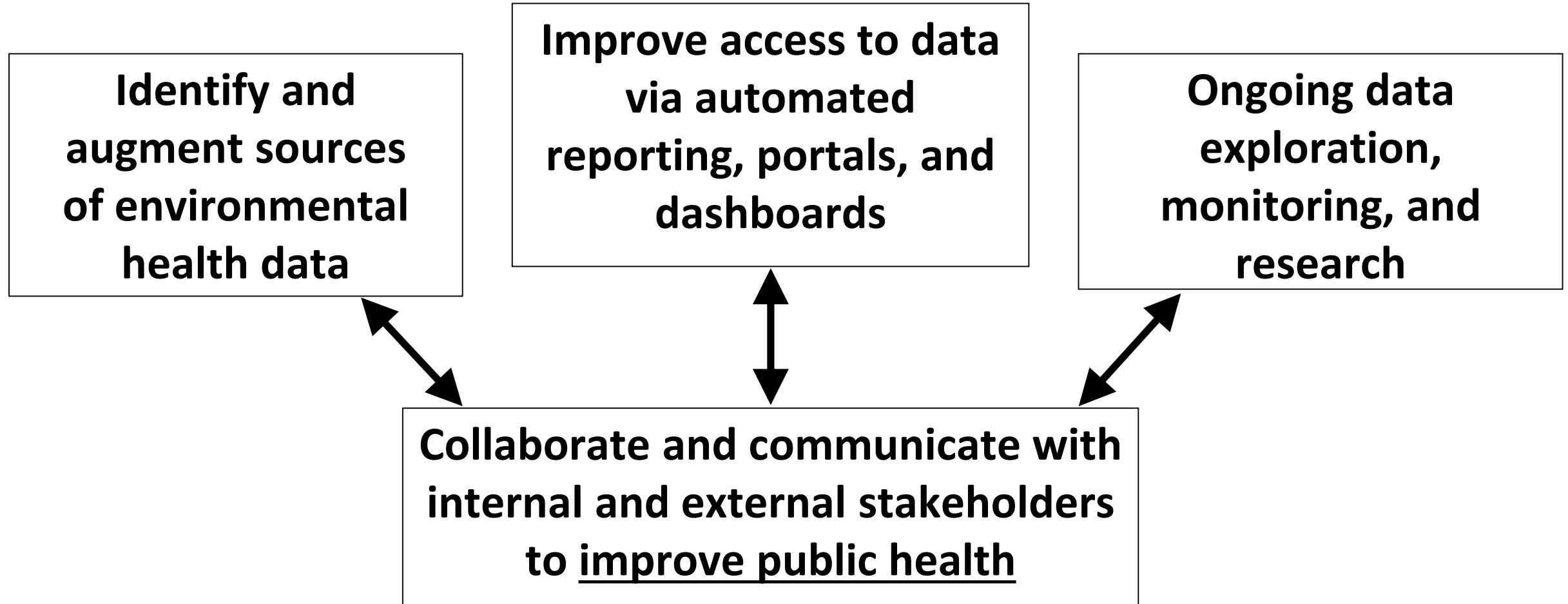
New York City Tracking Program → Bureau of Environmental Surveillance & Policy

- Build infrastructure (people, data, systems)
- Provide information that can inform policy, programs, and initiatives
- Educate the public



nyc.gov/health/tracking

NYC Tracking Strategies



NYC Tracking Instrumental in Strengthening Existing Environmental Health Programs

➤ **Building electronic data capture systems**

- Rat inspections
- Food safety inspections
- Child care center inspections

➤ **Automated, web-based reporting**

- To guide program operations
- To track success
- To target resources where most needed

Analysis Of Programmatic Data Has Informed Public Health Initiatives

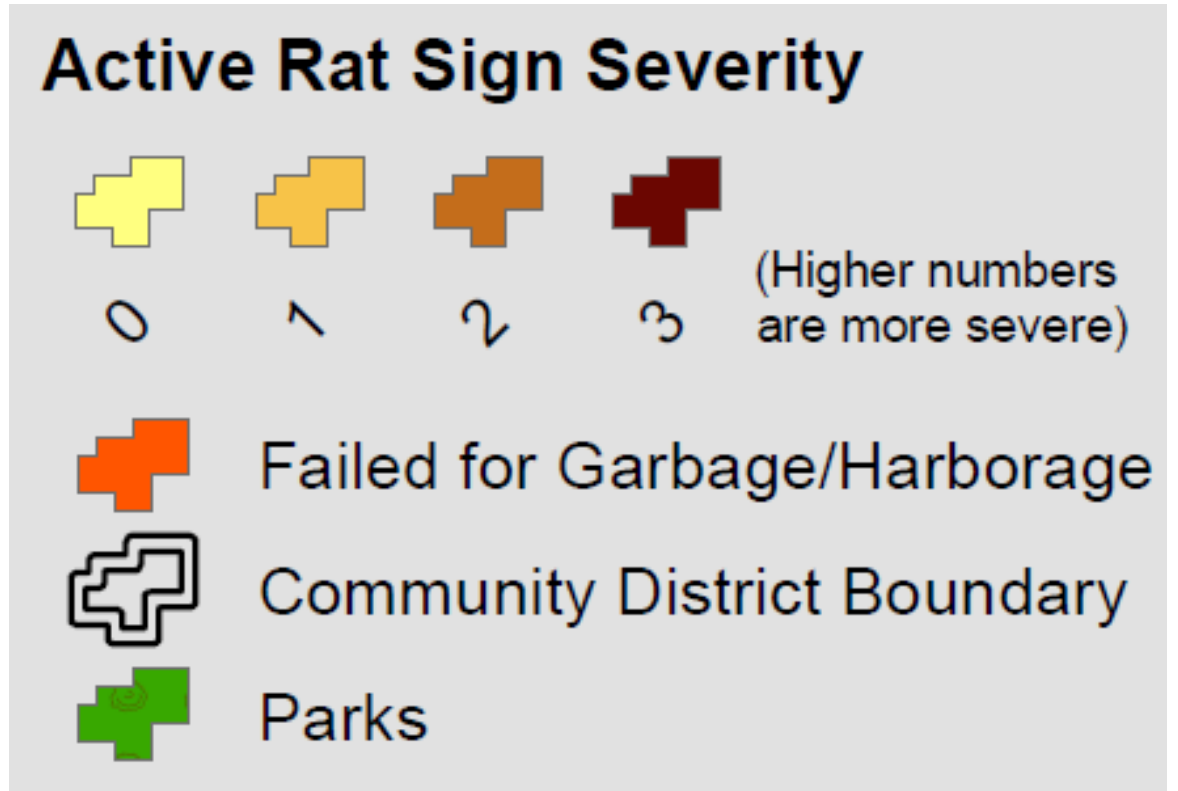
Restaurant Inspections

- Restaurant letter grading program
- Publicly posted grades to communicate inspection findings
- Targets more frequent inspections to the poorest performers



Analysis Of Programmatic Data Has Informed Rat Control

- **Rat Indexing**
- **Canvases the city for rats systematically**
 - Block by block
- **Uses signs of rats to direct placement of bait, instead of only where complaints come from**



Analysis Of Programmatic Data Has Informed UPK Initiative

- **Universal Pre-Kindergarten (UPK)**
- **Informing child care center placement and capacity as services expand**



Analysis Of Programmatic Data Has Informed Use of Poison Control Center

- **Poison Control Center (PCC)**
- **Daily monitoring of location of the calls**
- **PCC staff reach out to areas least likely to call—to reduce inequity of use**



Tracking Infrastructure Has Also Strengthened Emergency Response

- Assessing residential building needs in the event of a coastal storm



- Surveillance of evacuation shelters

NEW YORK CITY DEPARTMENT OF HEALTH AND MENTAL HYGIENE BUREAU OF FOOD SAFETY AND COMMUNITY SANITATION									
ENVIRONMENTAL HEALTH ASSESSMENT FORM FOR SHELTERS									
I. PHS INFORMATION:									
PH S Name:			Date:			Time:			
Mobile No.:			E-mail:						
II. Facility information									
Location Name:									
Location Address:						Borough:			
Facility Contact:						Phone No.:			
Facility Capacity:			Census:			Type of Facility:			
III. FACILITY CONDITIONS									
	Yes	No	Unk/NA				Yes	No	Unk/NA
1. Hot Water:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			2. Heat:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Adequate Space:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			4. Tripping Hazard:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Rodents:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			6. Roaches:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Flies:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			8. Clean:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Solid Waste Adequately Contained in Receptacles or Garbage Bags:							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Solid Waste Picked Up Regularly by Carter or DSNY:							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
IV. FOOD									
	Yes	No	Unk/NA				Yes	No	Unk/NA

Information Technology Helps Us Inform The Public About Environmental Efforts To Control Zika And West Nile Virus

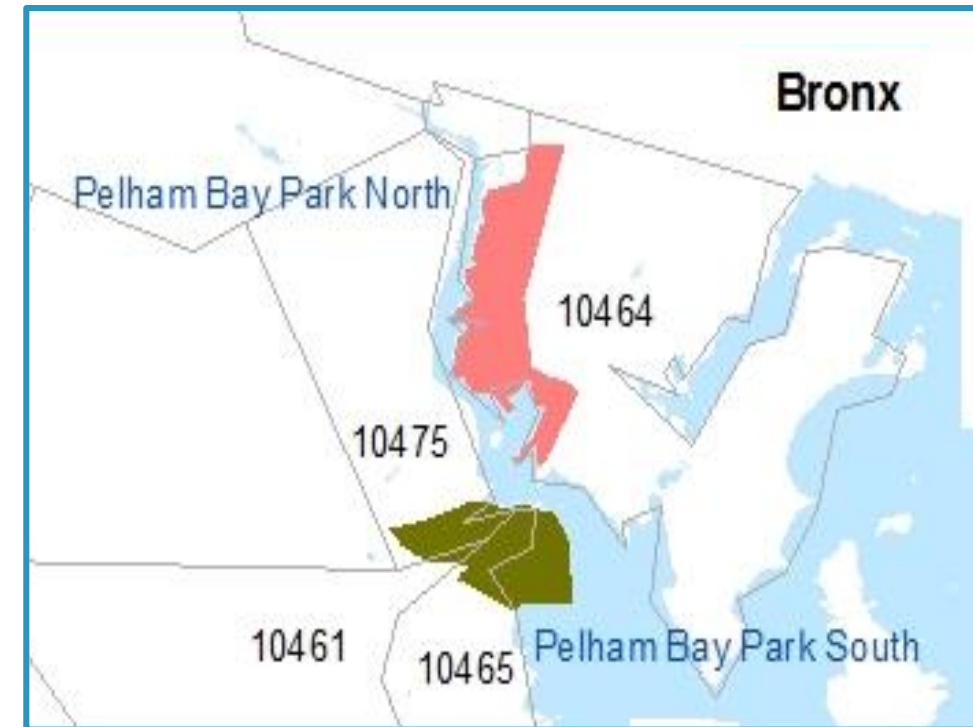
Mosquito Spraying Events

The Health Department monitors mosquito populations and applies pesticides when appropriate throughout the summer to reduce the number of **mosquitoes** and to minimize the risk of mosquito-borne diseases such as the **West Nile Virus** and the **Zika Virus**.

2016 Mosquito Spraying/Adulticiding* & Aerial Larviciding** Schedule

Date(s) ***	Borough, Neighborhood(s), Zip Code(s)	Status
May 14 between 6AM & 7PM	larvicide in <u>Bronx</u> <ul style="list-style-type: none">• Neighborhoods: Pelham Bay Park North, Pelham Bay Park South• Zip codes: 10464, 10465, and 10475 Additional information: <ul style="list-style-type: none">• Mosquito Control Notice (PDF)• Location	Completed

Mapping of Mosquito Spraying Events



NYC Tracking Supported New Initiatives – Four Examples

1. Improving Air Quality

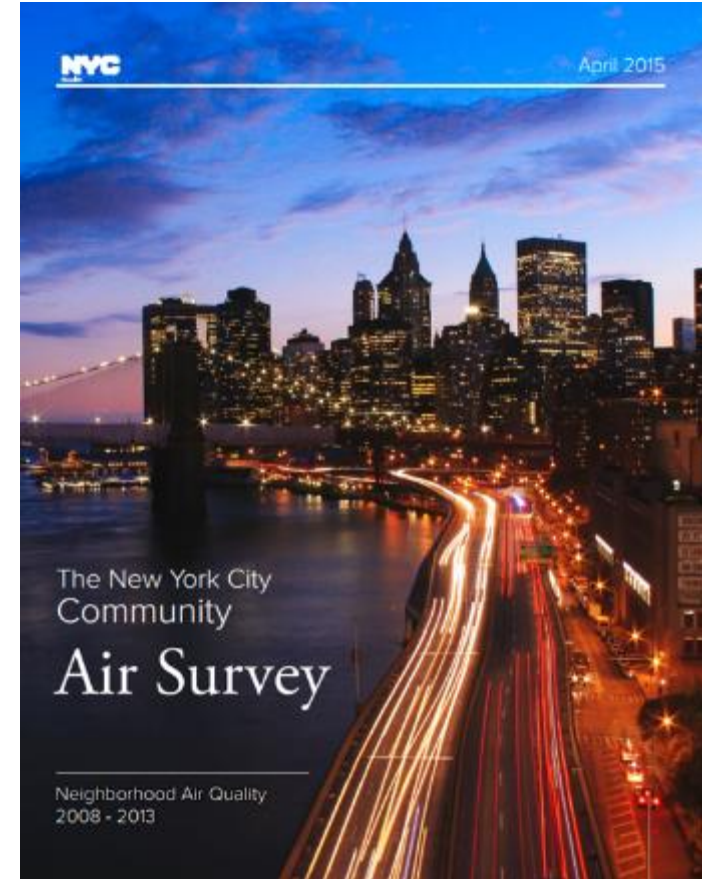
**3. Improving Resilience
to Climate Effects**

**2. Reducing Exposure
to Pesticides**

**4. Reducing Exposure
to Mercury**

1. Improving Air Quality — Using Local Air Monitoring

- **Informed phase-out of residual heating oil use in buildings**
- **Estimated health benefits of air pollution controls**
- **Identified high-risk neighborhoods for boiler switching and energy efficiency upgrades**

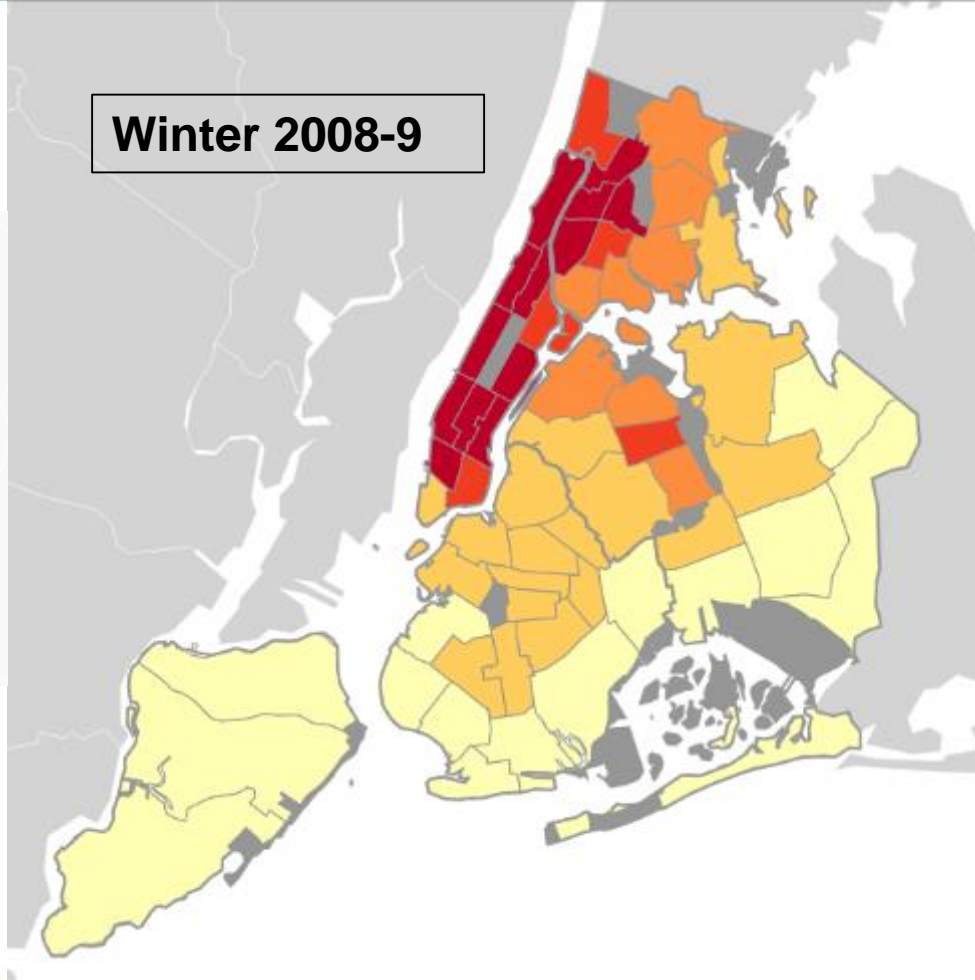


Air Concentrations of SO₂ Declined 70% Since Clean Heat Measures In Effect

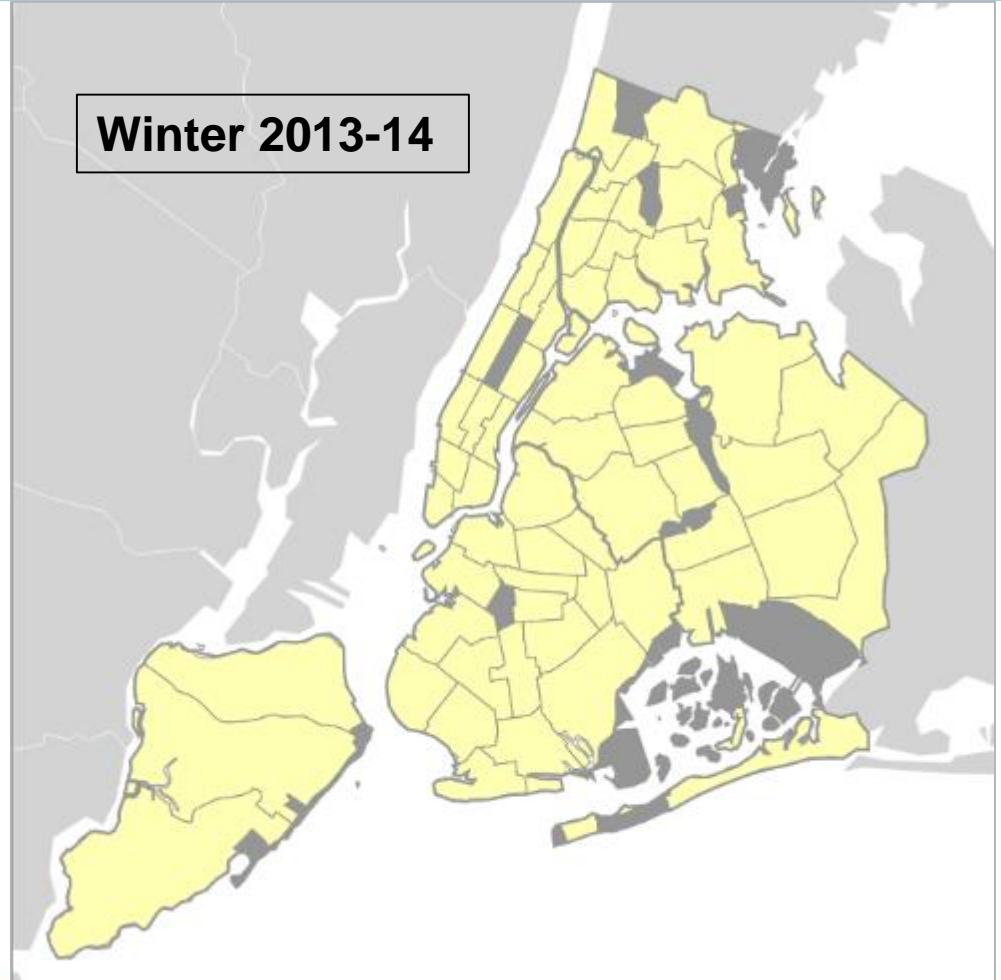
Mean (ppb)



Winter 2008-9



Winter 2013-14



2. Reducing Use of Harmful Pesticides

Analysis of NYS Pesticide Sales and Use Registry data



Pesticide use in NYC rivaled use in agricultural areas

IPM in public housing study



Integrated pest management (IPM) is a safer alternative

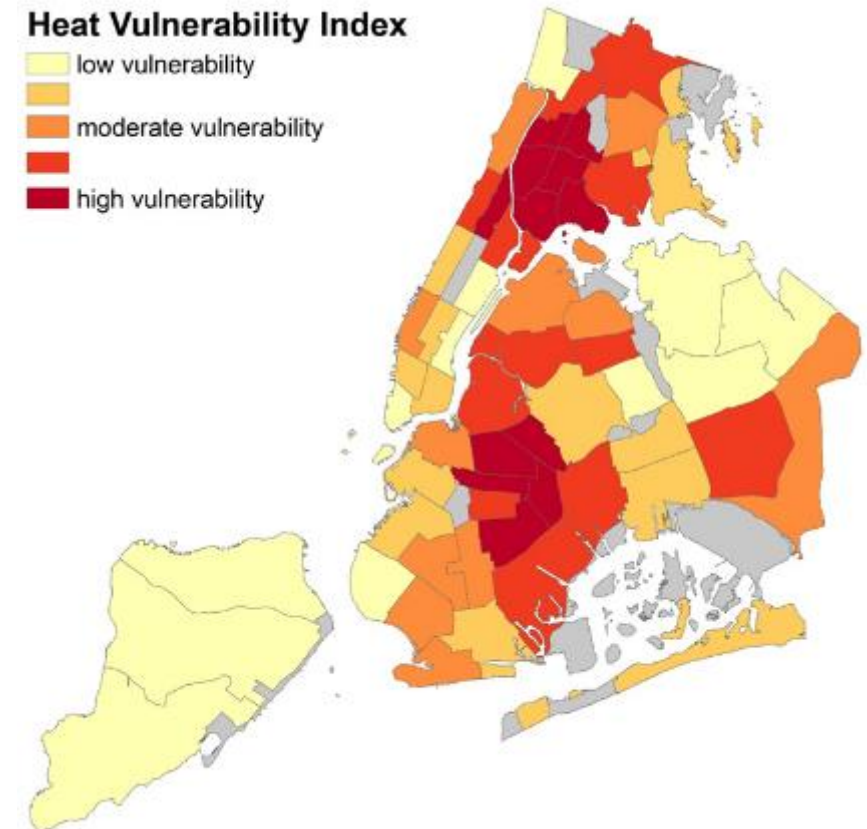
Local Law 37



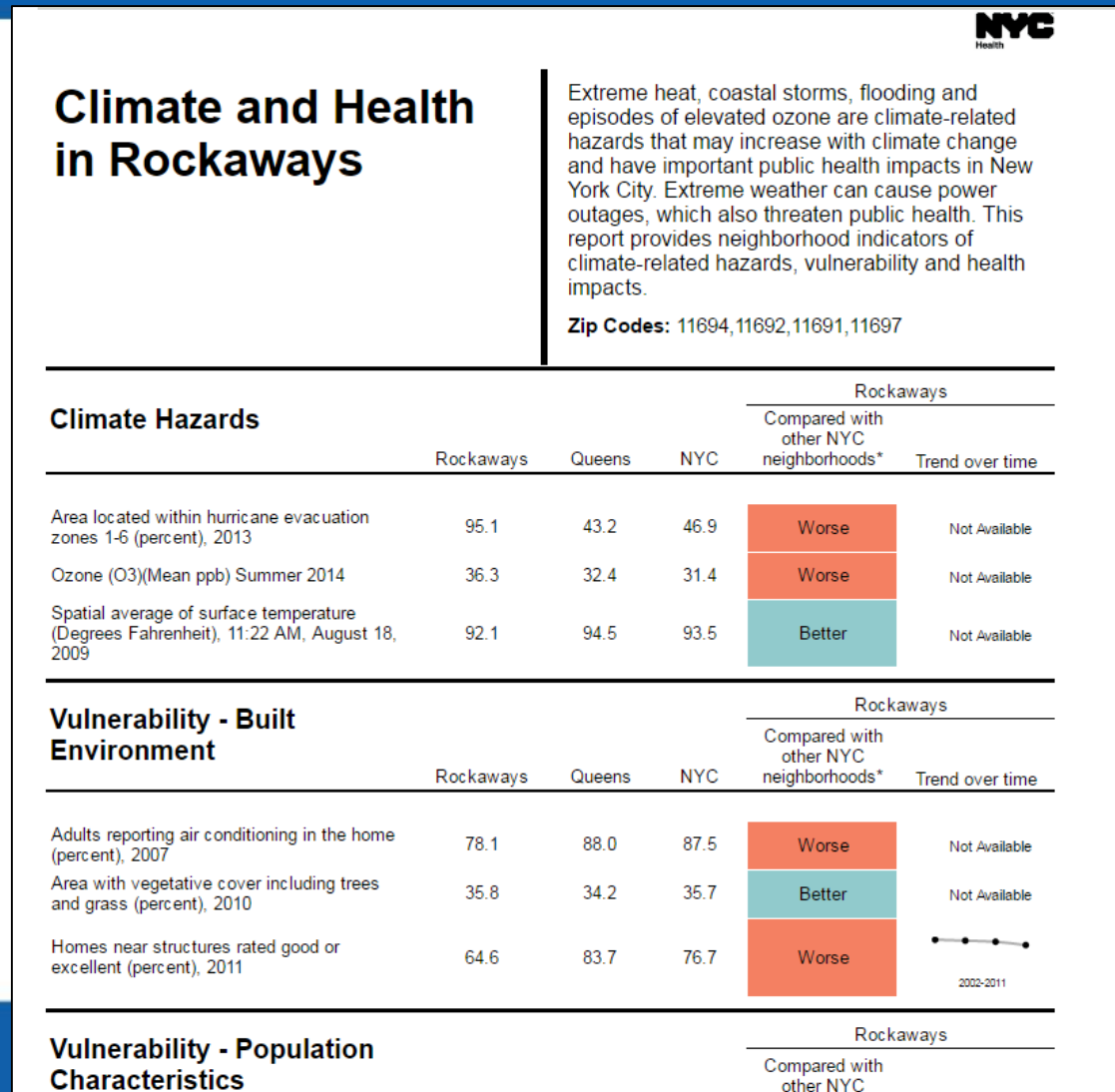
Requires all city agencies to use IPM wherever possible and to report pesticide use to the health department

3. Improving Resilience to Climate Effects

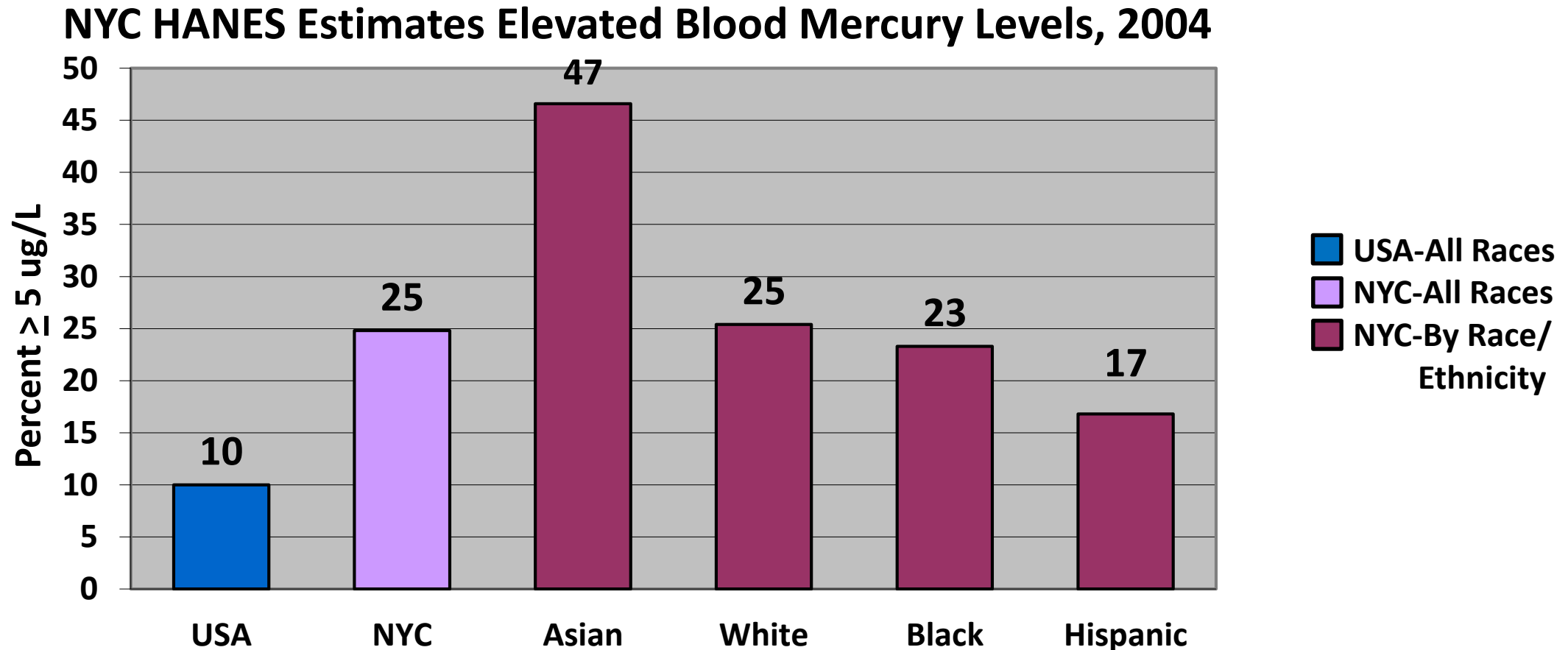
- **Identify more appropriate threshold for heat warnings, based on observed heat-related effects**
- **Quantify risks and reach out to vulnerable groups**
- **Advocate for increased access to air conditioning**
- **Support studies to assess health impacts of power outages**



3. Using Data to Inform Climate and Health Priorities by Neighborhood

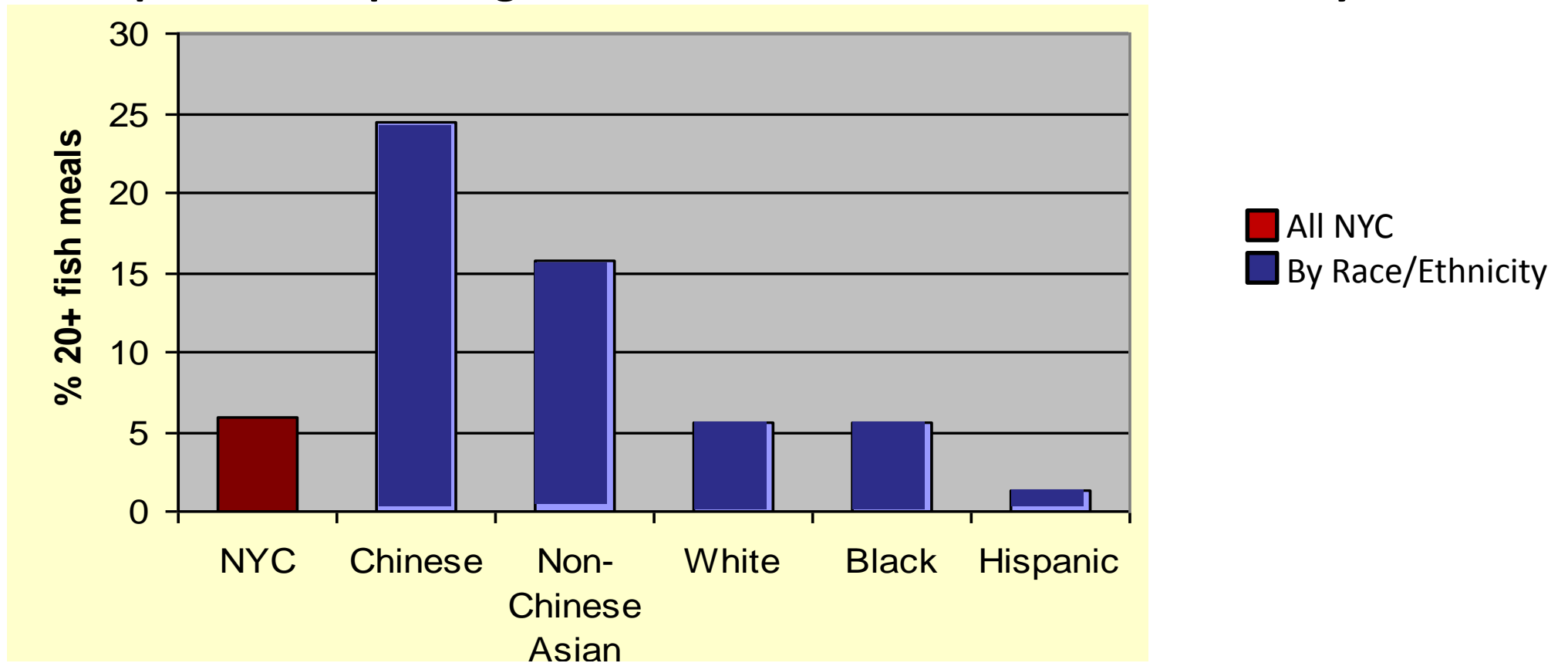


4. Reducing Exposure to Mercury

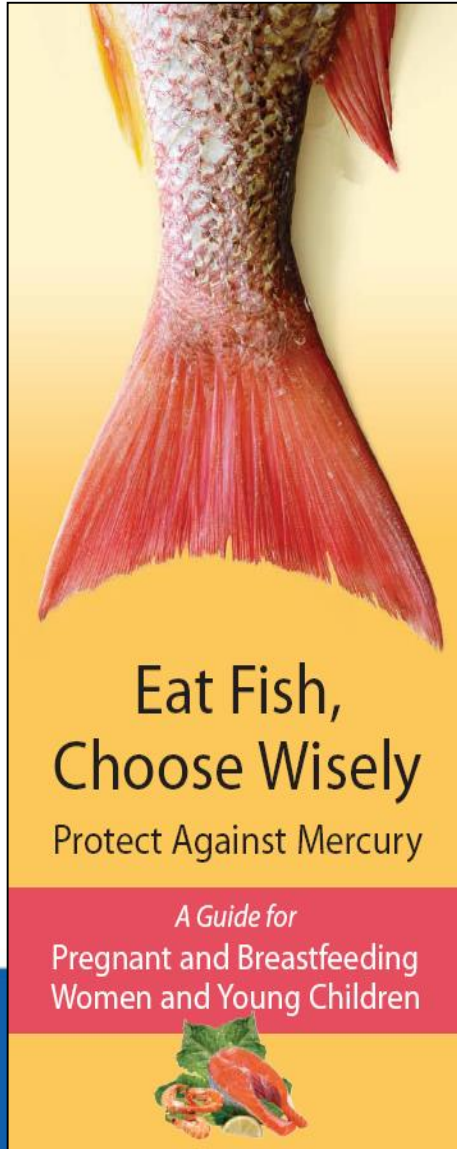


Elevated Blood Mercury Is Typically Due to Frequent Fish Consumption

Percent of Adult Population Reporting 20 or More Fish Meals in the Last 30 Days, 2004



We Encouraged High-risk Groups To Choose Lower Mercury Fish



Highest risk from exposure is to the developing nervous system

- **Press Release (with extensive media follow-up)**
- **Health care provider advisory letter on mercury in fish (electronic)**
- **Brochure in**
 - English, Chinese, Japanese, Korean, Spanish

www1.nyc.gov/site/doh/health/health-topics/mercury-in-fish.page

Lots of Press Followed Publication of Our Findings

High Mercury Levels Are Found in Tuna Sushi

By MARIAN BURROS JAN. 23, 2008

Correction Ap



Tuna sushi is a popular item

Recent labor
Manhattan s
pieces a week
Environmental Protection Agency.

FOOD

More Testing of Seafood to Address Mercury Concerns

By MARIAN BURROS JAN. 30, 2008

A NUMBER of restaurants and re
have started testing the fish they s
amount of mercury in seafood, an
beginning to examine the mercury
region.

The regional office of the federal a
city found high levels of mercury i
will examine the 20 most common
tuna.

THEATER

Piven Leaves Show Amid Concerns for His Health

By DAVE ITZKOFF DEC. 18, 2008

A real-life fish story has resulted in [Jeremy Piven](#)'s withdrawal from the current Broadway revival of the [David Mamet](#) comedy "Speed-the-Plow."

Mr. Piven, the actor and "Entourage" star, left the production this week after having previously sought an early release from the play. Mr. Piven's doctor said he should not continue to perform because he was suffering from elevated levels of mercury, which may have been the result of large amounts of fish in his [diet](#).

In 2004, We Also Identified Very Elevated Urine Mercury Levels

Urine Hg Level	Number	Likely Source	Participant Ethnicity
20–50 mcg/L	9	5 cream / 4 Don't know	6 Dominicans 1 Jamaican 1 Salvadoran 1 African-American
> 50 mcg/L	4	4 cream	4 Dominicans

All women, mostly Dominican, using mercury-containing skin-lightening creams



This Led to Embargo of Hundreds of Products Found in Stores



Press Release

New York City Department of Health
and Mental Hygiene
Office of Communications

FOR IMMEDIATE RELEASE
CONTACT: Sandra Mullin/Sid Dinsay

Business Hours (212) 788-5290
After Business Hours (212) 764-7667
Thursday, January 27, 2005

NYC HEALTH DEPT. WARNS AGAINST USE OF "SKIN-LIGHTENING" CREAMS CONTAINING MERCURY OR SIMILAR PRODUCTS WHICH DO NOT LIST INGREDIENTS

Almost a Dozen Products Made in the Dominican Republic, Hong Kong and China Do Not Conform to FDA Regulations; Sale of These Products Illegal Under City Law

NEW YORK CITY - January 27, 2005 - Following a confirmed case of mercury poisoning in a New York City resident who had been using an imported "skin-lightening" cream, the New York City Department of Health and Mental Hygiene (DOHMH) and the Mayor's Office of Immigrant Affairs

Skin-Lightening Creams — Warning —

Skin-lightening creams that contain mercury are dangerous — mercury is a poison.

Read the labels of all skin products.

Do not use if:

- mercury is listed as an ingredient, or if
- ingredients are not listed

See your doctor if you use mercury-containing products.

Call 311 or 212-POISONS (212-764-7667) for more information.



Cremas Blanqueadoras — Alerta —

Las cremas blanqueadoras que contienen mercurio son peligrosas — el mercurio es un veneno.

Lea la etiqueta de todo producto para la piel.

No use un producto si:

- la etiqueta indica que mercurio es un ingrediente, o si
- los ingredientes no están listados

Vea a su médico si usted usa productos que contienen mercurio.

Llame al 311 o 212-VENENOS (212-836-3667) para más información.



Do Not Use These Products/
No Use Estos Productos

- Recetas de la Farmacia Normal — Crema Blanqueadora
- Miss Key Crema Blanqueadora
- Santa Crema
- Dermaline Skin Cream
- Dr. Collado Jabón Germicida

The New York City Health Code Section 71.05 prohibits sale of mercury-containing skin products. La sección 71.05 del Código de Salud de la Ciudad de Nueva York prohíbe la venta de productos de la piel que contienen mercurio.

Second NYC HANES Conducted in 2013–14

- **Biomonitoring for mercury was included again**
- **Preliminary analyses suggest declines in blood mercury are greater than declines observed nationally**
- **A manuscript is in preparation**

Where Is New York City Tracking Program Heading?

- **Using new technologies to support operational programs by pulling data from a variety of sources**
 - Improving food safety
 - Expanding access to child care
 - Safer, more effective pest control
 - Responding to complaints, emergencies, and emerging or continuing threats

Where Else Is New York City Tracking Program Heading?

➤ **Expanding collaborations to develop new policies and initiatives**

- Improving air quality
- Increasing resilience to extreme weather
- Reducing pesticide use
- Supporting “Vision Zero” to reduce traffic deaths and injuries



➤ **Coming soon!**

- Reduce ambient noise
- Promote active design of the built environment
- Use health impact assessment to inform environmental sustainability goals

Environmental Public Health Tracking: A Tool for Public Health Decision-making in Massachusetts

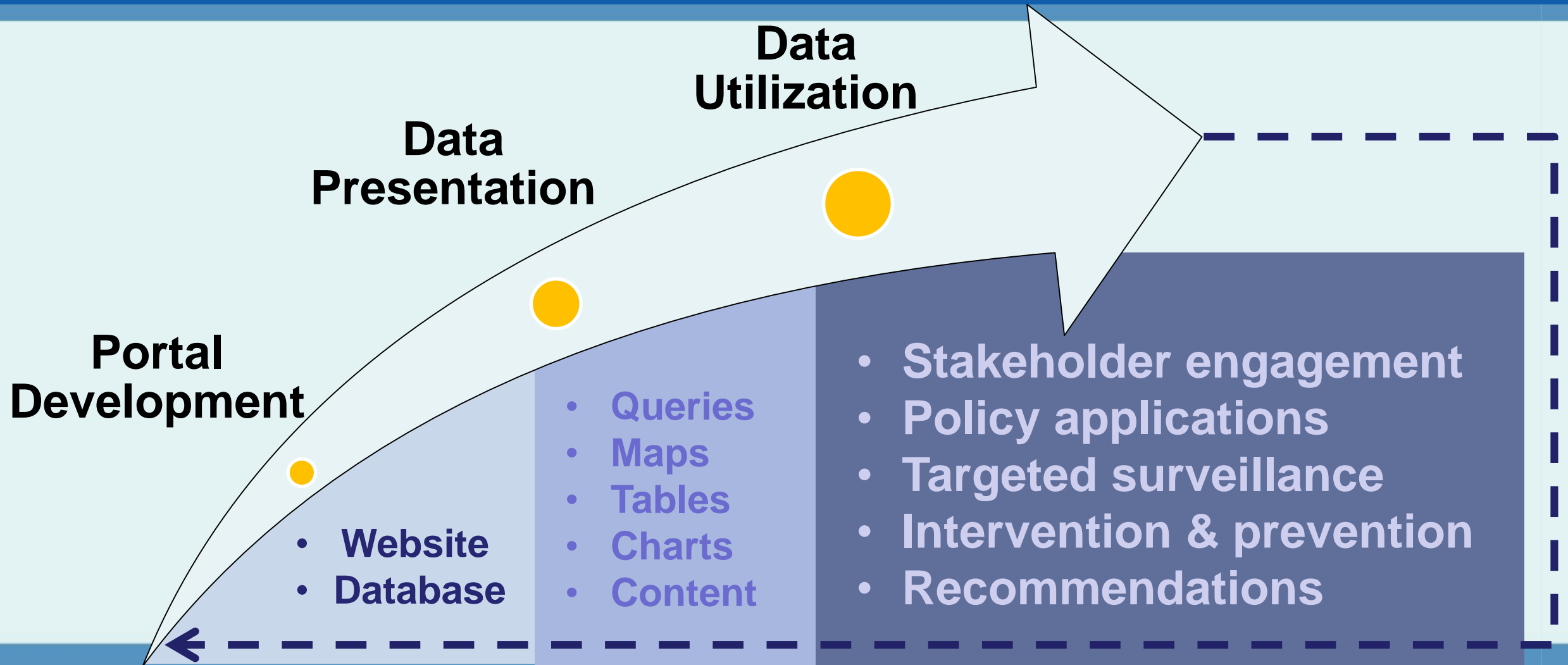


Jan Sullivan

Acting Director, Bureau of Environmental Health and *Co-PI*, Tracking Program

Massachusetts Department of Public Health

Massachusetts Evolution of Tracking



Two Ways Tracking Data Informs Massachusetts Department of Public Health Policies and Actions

- 1. Health Outcome Surveillance**
- 2. Health in Environmental Policy**

Health Outcome Surveillance in Massachusetts and Data Utilization Examples

➤ **Community and Census Tract Level Health Data**

- Hallmark characteristic of Massachusetts Tracking
- An expectation of stakeholders in Massachusetts
- Public Health Performance Measures are often evaluated at this level

➤ **Data Utilization Examples**

- Community Profiles
- Lead in Drinking Water Monitoring
- Population Vulnerability to Extreme Weather Events and Climate Change

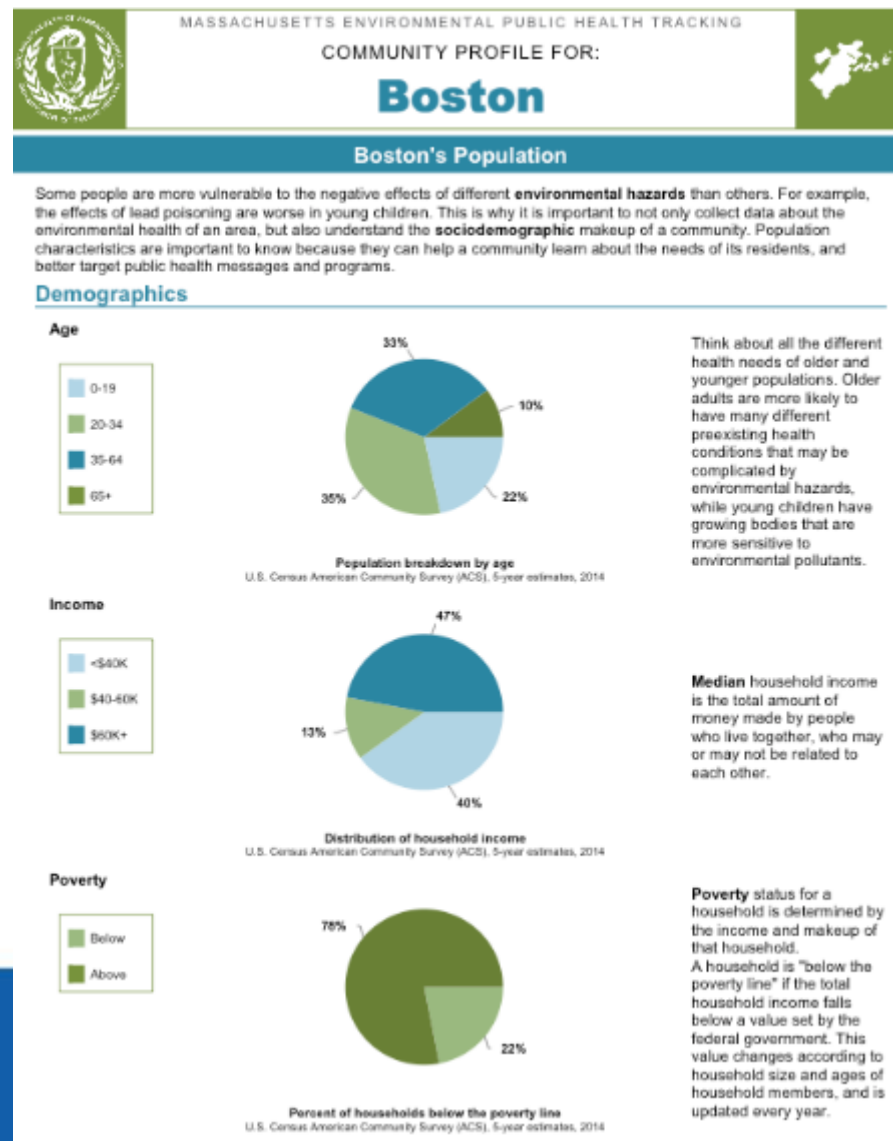
2016 Boston Community Health Profile

Geography



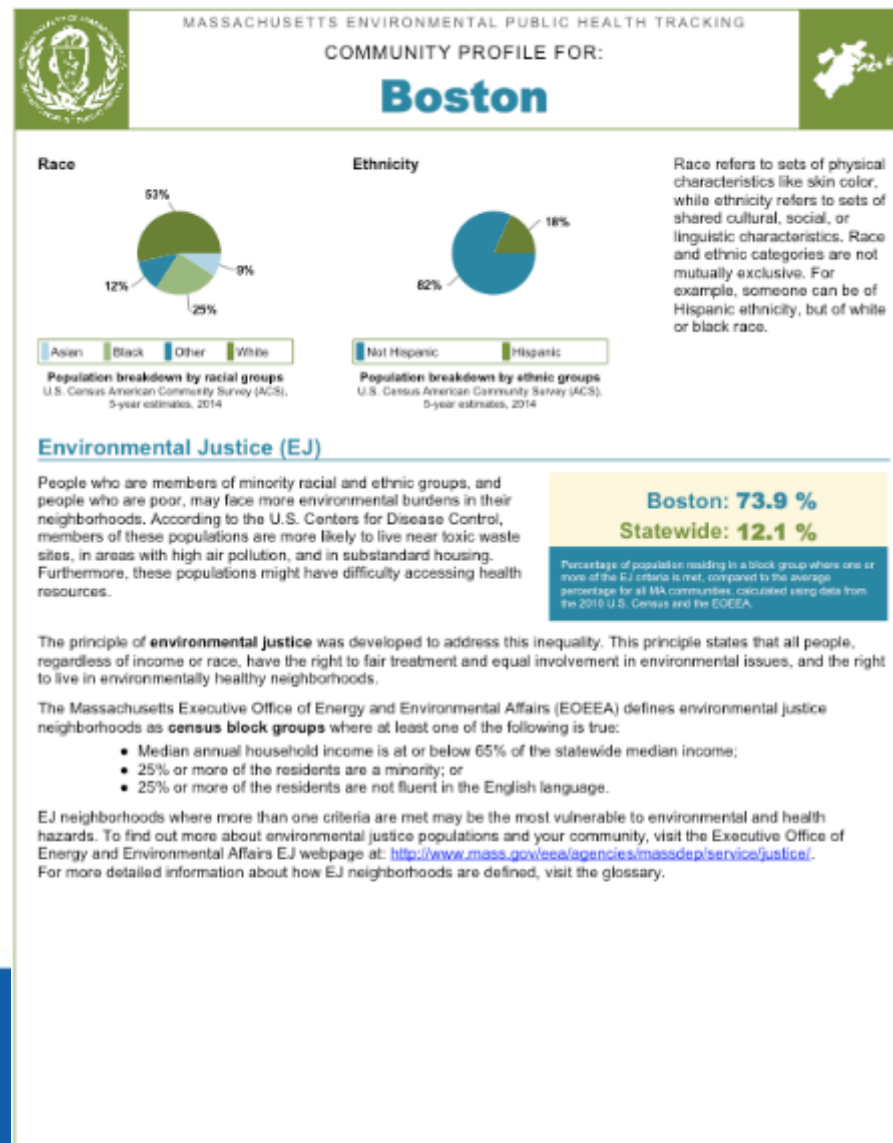
2016 Boston Community Health Profile

Population Demographics



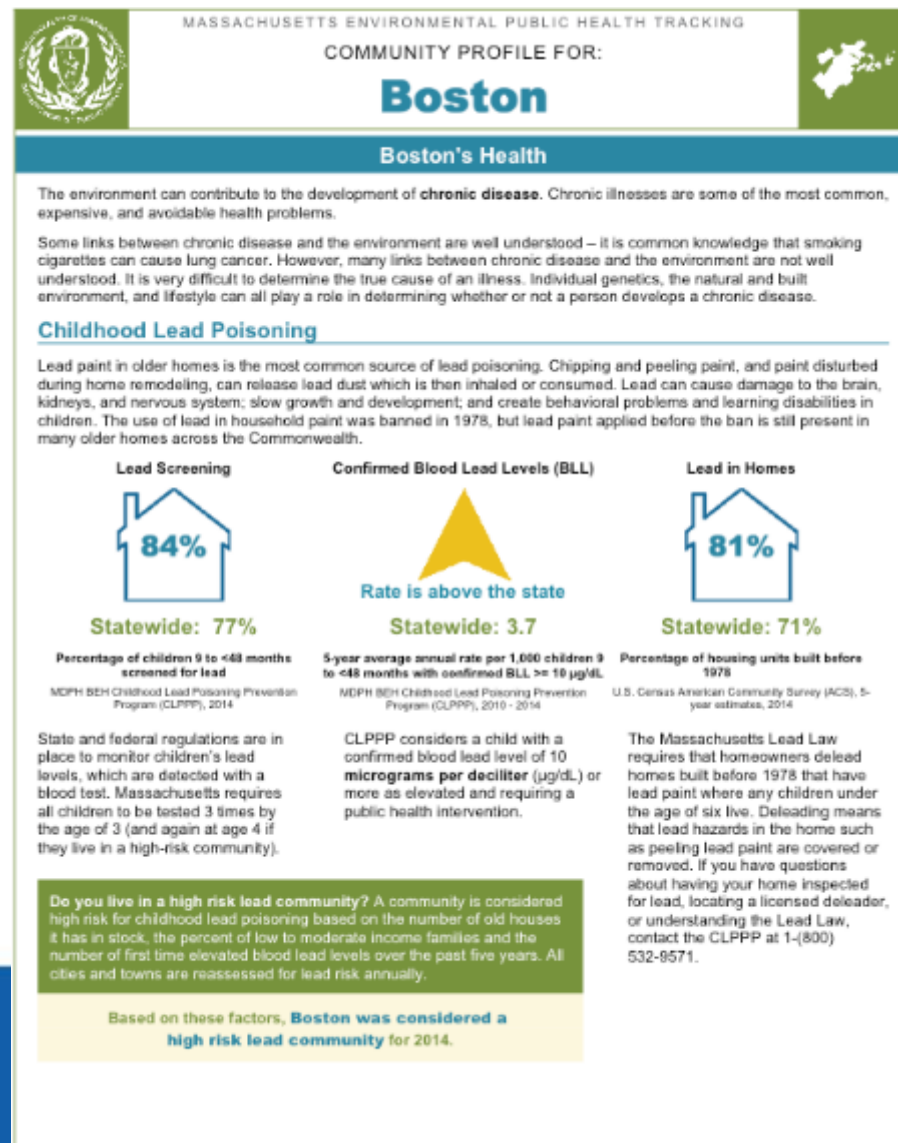
2016 Boston Community Health Profile

Environmental Justice



2016 Boston Community Health Profile

Childhood Lead Poisoning



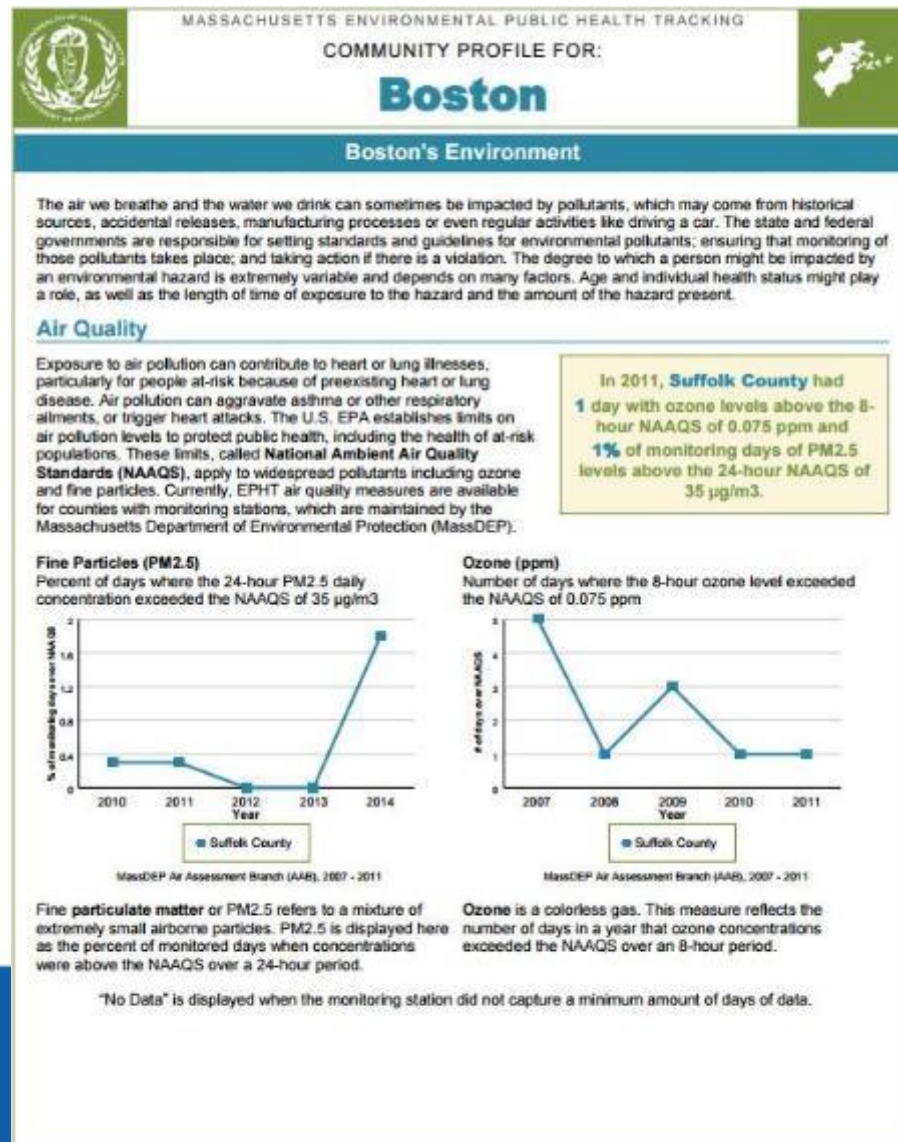
2016 Boston Community Health Profile

Heart Attack and Asthma




2016 Boston Community Health Profile

Air Quality



2016 Boston Community Health Profile


Drinking Water Quality



MASSACHUSETTS ENVIRONMENTAL PUBLIC HEALTH TRACKING

COMMUNITY PROFILE FOR:

Boston



Drinking Water Quality

The U.S. EPA sets limits for acceptable and safe levels of contaminants in drinking water, and the MassDEP Drinking Water Program is responsible for monitoring and enforcing those limits. The EPHT program has information available for nine contaminants.

Most people in Massachusetts drink water from a public **community water system**. Providers are responsible for testing water and reporting test results to the MassDEP. Contact your town water department or water provider to obtain a copy of current test results.

Some people have private wells on their properties that provide drinking water. Those individuals are responsible for testing their own well water to ensure it is safe for drinking.

It is important to track the water quality of community water systems. Health effects from potential contaminants will depend on the pollutant, the amount ingested, how it was ingested (for example, if the polluted water was introduced into the body by drinking or skin absorption) and the sensitivity of the individual.

Contaminants tracked by EPHT:

Arsenic
Atrazine
DEHP
Disinfection Byproducts
Lead
Nitrates
PCE
TCE
Uranium

Have a private well?

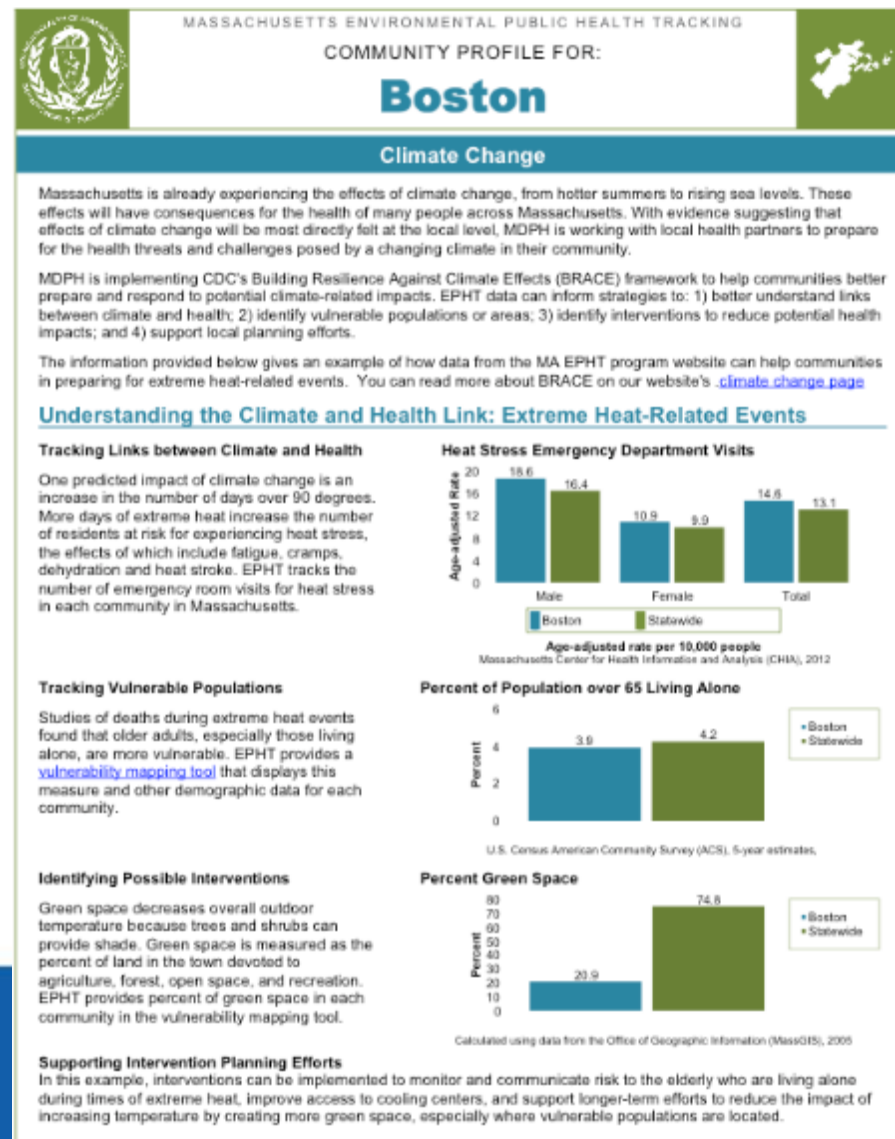
Visit MA DEP for drinking water testing recommendations

Boston receives water from the Massachusetts Water Resource Authority (MWRA). For water test results and violations please go to <http://www.mwra.com/water/testing/water-tests.htm>.

MassDEP Drinking Water Program, 2000 - 2013


2016 Boston Community Health Profile

Climate Change



2016 Boston Community Health Profile


Sources of Data



MASSACHUSETTS ENVIRONMENTAL PUBLIC HEALTH TRACKING

COMMUNITY PROFILE FOR:

Boston



What You Can Do

There are many ways to minimize the impacts of environmental hazards to your health and the health of your family.

- Get tested: Have your home tested for [radon](#) (1-800-RADON95) and for the presence of [lead](#) paint, especially if you live in a house or apartment built before 1978 (1-800-532-9571); if you drink [private well water](#), regularly have your water tested for contaminants.
- Read labels and follow instructions when using household chemicals.
- Wash fruits and vegetables before consuming, and follow [fish consumption advisories](#).
- [Monitor air pollution levels](#) and avoid strenuous activity when pollution levels are bad, especially if you have asthma.
- Maintain your car so it burns fuel oil efficiently, and take public transportation if possible.
- Avoid cigarette smoke and [quit if you are a regular smoker](#). (1-800-QUITNOW).
- Maintain overall good health by staying active and eating healthy foods.

**Learning about environmental public health in your community is the best place to start.
Together, we can work toward healthier communities.**

About the Data

Data presented on this profile are collected by many different partners of the MA EPHT Program and are the most up-to-date data available for each topic. For more information about the data visit <http://www.mass.gov/dph/matracking>.

Demographics: US Census Bureau, American Community Survey (ACS), 5-year estimates, 2010 <https://www.census.gov/programs-surveys/acs>

Geography: Office of Geographic Information, Commonwealth of Massachusetts, MassIT, 2005 <http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/>

Environmental Justice: Office of Geographic Information, Commonwealth of Massachusetts, MassIT, 2010 <http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/detelayers/cen2010ej.html>

Asthma prevalence: MDPH BEH, 2013-2014 school year <http://www.mass.gov/dph/asthma>

Hospitalization: Massachusetts Center for Health Information and Analysis (CHIA), 2012 <http://www.chiamass.gov/>

Childhood lead poisoning: MDPH BEH Childhood Lead Poisoning Prevention Program (CLPPP), 2014 <http://www.mass.gov/dph/clppp> and United States Census Bureau, 2014 <http://www.census.gov/>

Air quality: MassDEP Air Assessment Branch, 2007 - 2011 <http://www.mass.gov/eea/agencies/massdep/air>

Drinking water quality: MassDEP Drinking Water Program, 2009 - 2013 <http://www.mass.gov/eea/agencies/massdep/water/drinking>

Climate change: MDPH BEH and U.S. Centers for Disease Control (CDC) <http://www.cdc.gov/climateandhealth/trace.htm>

Contact Us

We appreciate your comments, suggestions, and questions. You may send an email to the MA EPHT program at MA-EPHT@State.MA.US. We can also be reached at 1-800-319-3042. Please leave a voicemail if calling after office hours.

Did you know? The MA EPHT program is part of a national network of state and local health departments committed to tracking environmental public health.

Acknowledgements

This program was made possible thanks to the U.S. Centers for Disease Control and Prevention grant for the Maintenance and Enhancement of the State and National Environmental Public Health Tracking Network.

2016 Boston Community Health Profile

Glossary to Understand the Terms



MASSACHUSETTS ENVIRONMENTAL PUBLIC HEALTH TRACKING

COMMUNITY PROFILE FOR:

Boston



Glossary

Age-adjusted rate - A statistical method applied to the rates of a disease in a population that allows comparison among populations with different age distributions; also known as age-standardized rate.

Census block group - A geographic area used by the U.S. Census. Block groups are smaller than census tracts and usually hold between 600 to 3,000 people.

Chronic disease - A chronic disease is an illness that is persistent over time. According to the U.S. Centers for Disease Control and Prevention, chronic diseases are among the most prevalent, expensive and preventable diseases.

Community Water System (CWS) - Any water system that provides water for human consumption through pipes or other constructed conveyances to at least 15 service connections or serves an average of at least 25 people for at least 60 days a year.

Confirmed Blood Lead Level - A confirmed blood lead specimen is either a single venous blood lead specimen of any value, or the highest confirmed value of two or more capillary blood lead specimens ≥ 10 $\mu\text{g/dL}$ drawn within 12 weeks of each other.

Deciliter (dL) - A metric measure of capacity that is 1/10th of a liter.

Environmental hazard - A substance or situation in the environment that might adversely affect human health. People can be exposed to physical, chemical, or biological toxins from various environmental sources through air, water, soil, and food.

Environmental Justice (EJ) - The fair treatment and meaningful involvement of all people regardless of race, national origin, color, or income when developing, implementing, and enforcing environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear more than its share of negative environmental impacts.

Median - The median is the number in a data set that separates the upper half of the data in the data set from the lower half.

Micrograms (μg) - Unit of measure for weight/mass equal to one-millionth of a gram used to measure the concentration of pollutants in the air.

National Ambient Air Quality Standards (NAAQS) - Standards established by U.S. EPA that apply to outdoor air throughout the country.

Ozone - There are two types of ozone—"good" ozone and "bad", ground-level ozone. Good ozone occurs high in the atmosphere and forms a layer that deflects harmful ultraviolet (UV) rays, preventing them from reaching the Earth. Bad ozone is an odorless, colorless gas that is created by a chemical reaction and can affect health.

Particulate matter - "Particles" or "particulate matter" are terms used to describe the mixture of solid particles and liquid droplets in the atmosphere. The microscopic solid and liquid particles are of human and natural origin and can vary greatly in size and composition.

Poverty - Poverty status for a household is determined by the income and makeup of that household. A household is "below the poverty line" if the total household income falls below a value set by the federal government. For more information about how the government defines poverty, including tables of poverty thresholds, visit the U.S. Census Bureau's Poverty webpage (<https://www.census.gov/hhes/www/poverty/index.html>).

PPM - Parts per million; denotes 1 part per 1,000,000 parts. Used to measure the concentration of ozone in the air.

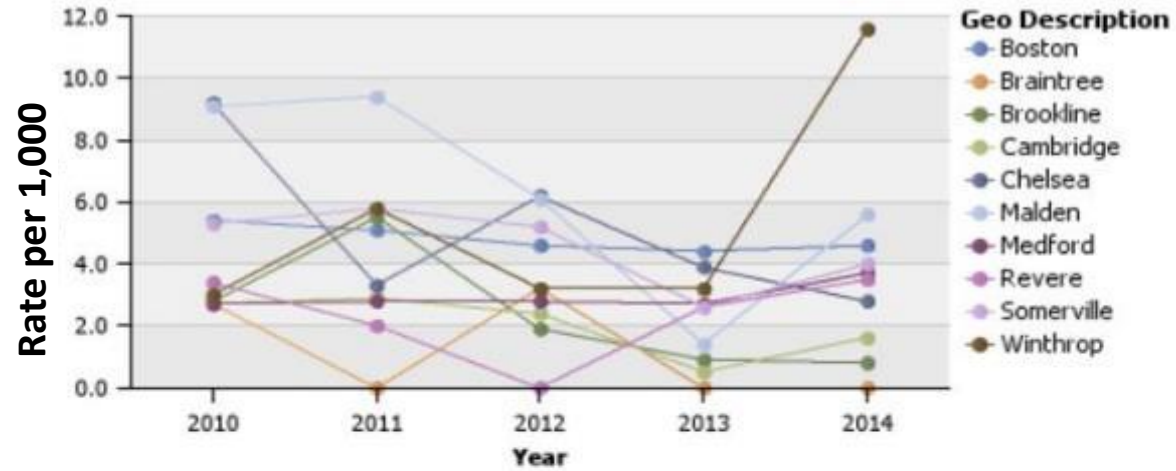
Prevalence - The proportion of individuals in a population having a disease or condition. Prevalence is a statistic that refers to the number of cases of a disease that are present in a particular population at a given time.

Sociodemographic - A term describing data relating to sociologic and demographic factors.

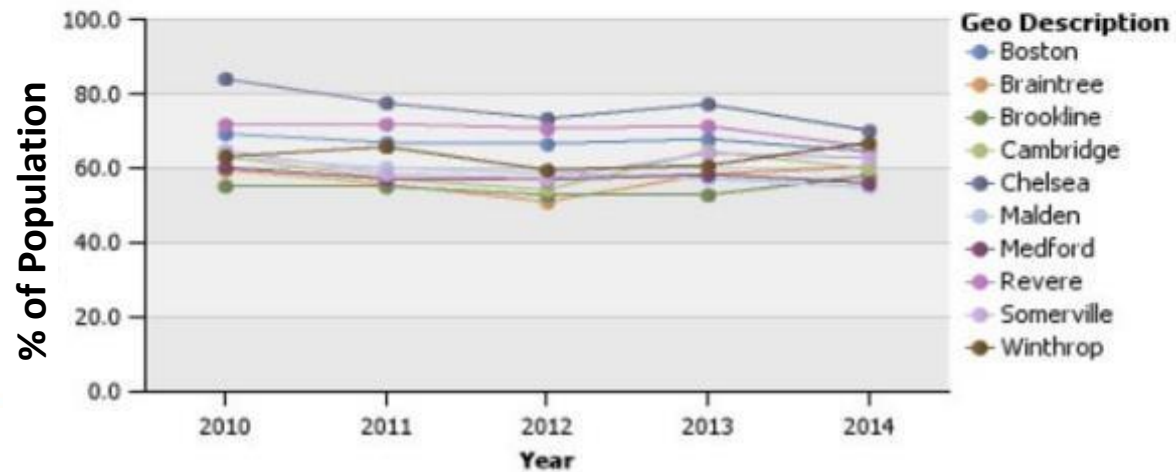
72

Blood Lead Dashboard To Track and Detect Exposures

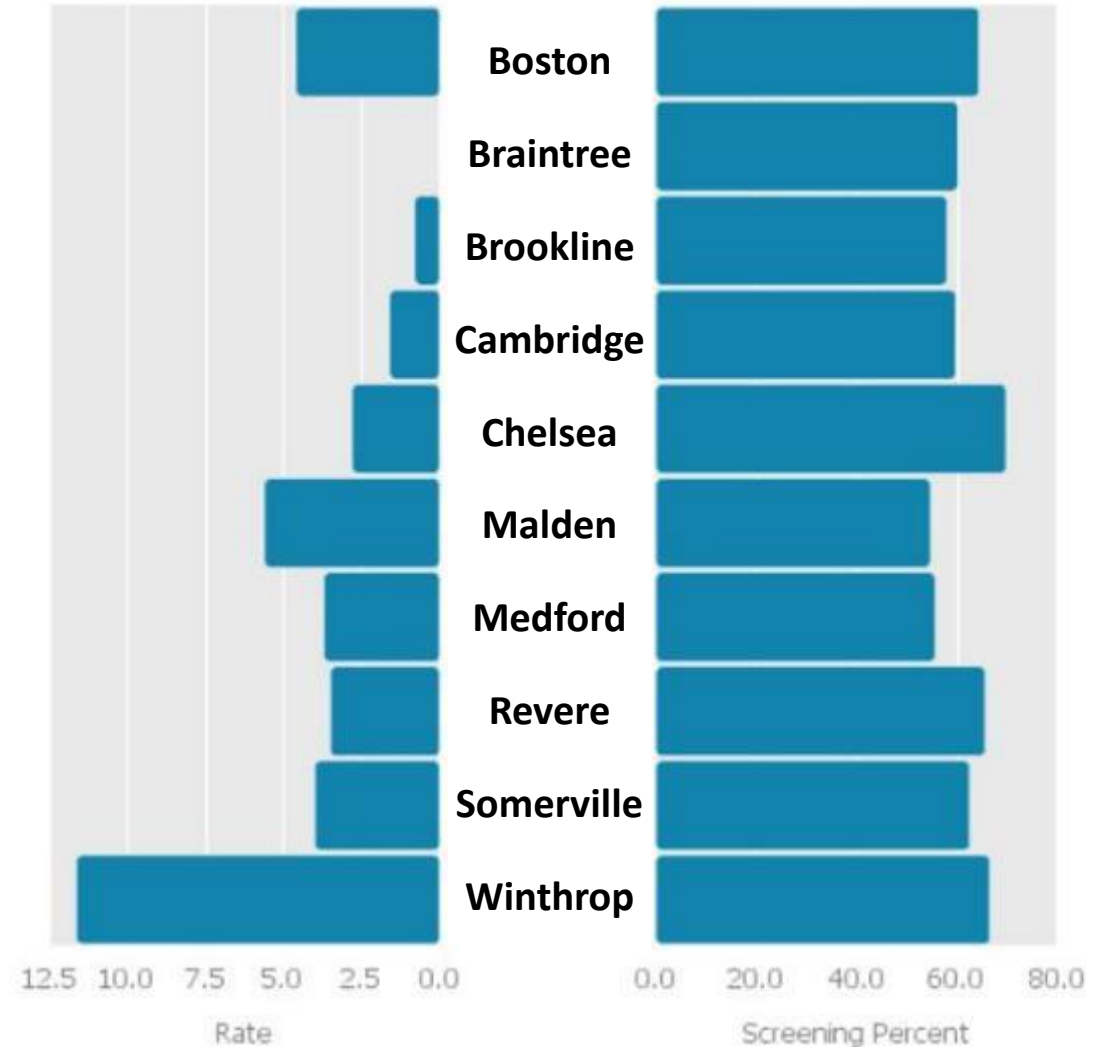
Prevalence of confirmed BLLs ≥ 5 ug/dL



Percent Screened

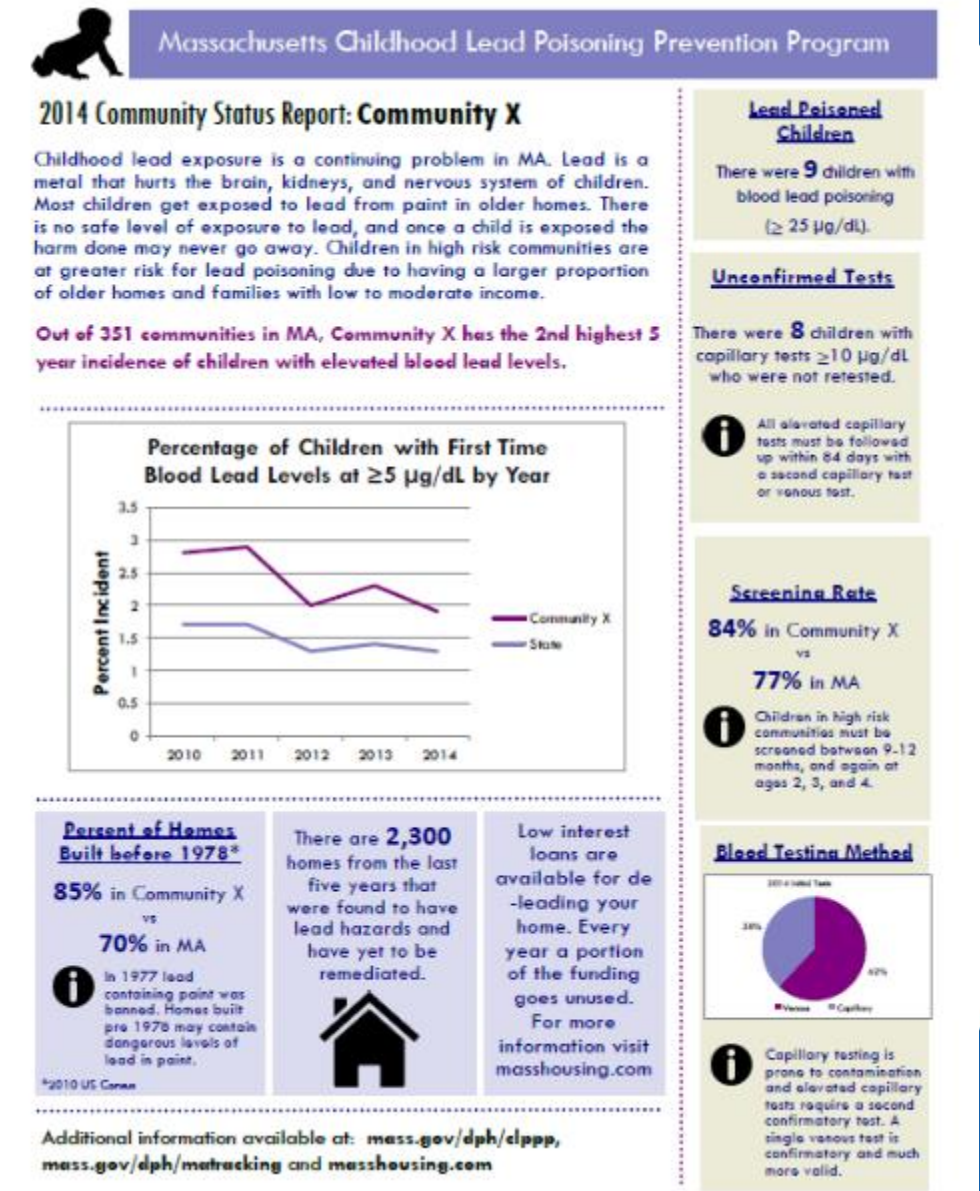


Prevalence of confirmed BLLs ≥ 5 ug/dL and Screening Rates for 2014



Community Lead Report Card

- Annually distributed to community Boards of Health
- Our portal automatically updates as new data available
 - Community screening rate
 - Community percent of children tested compared to state
 - Number of homes to remediate



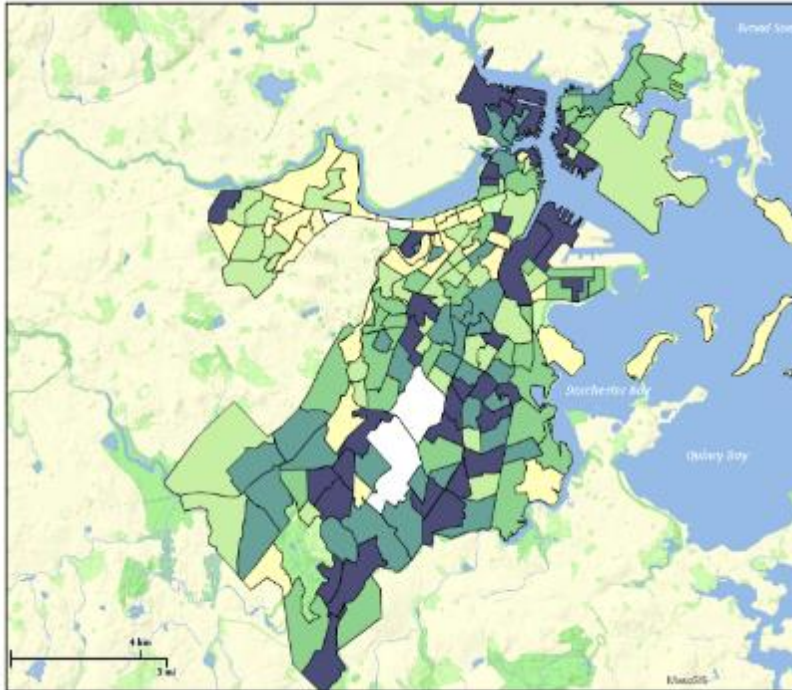
Community Lead Report Card

Back Page Has Map of Screening and Prevalence

Percent Screened

% Screened

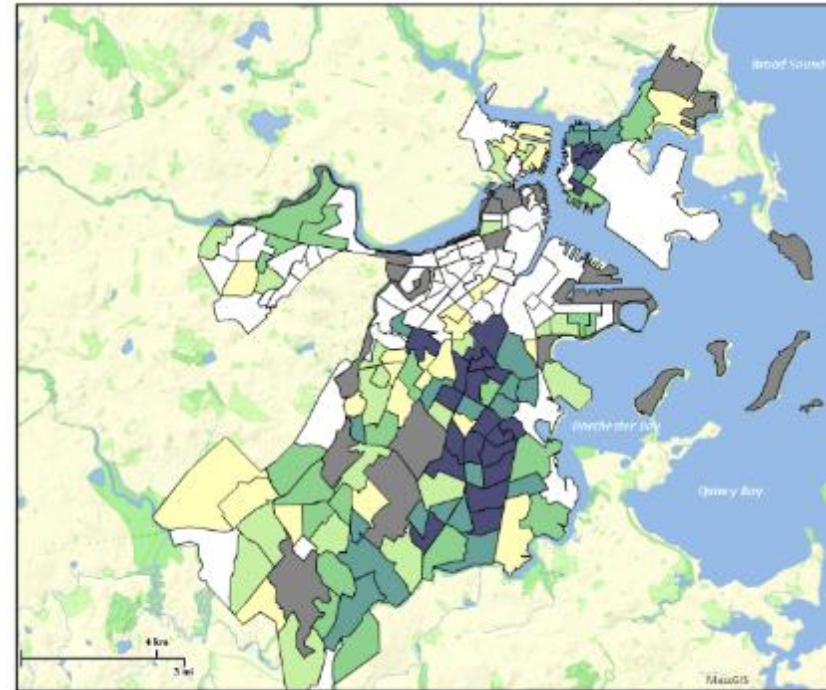
- [0 - 52.50]
-] 52.50 - 64.30]
-] 64.30 - 74.10]
-] 74.10 - 85.90]
-] 85.90 - 100]
- Not Shown



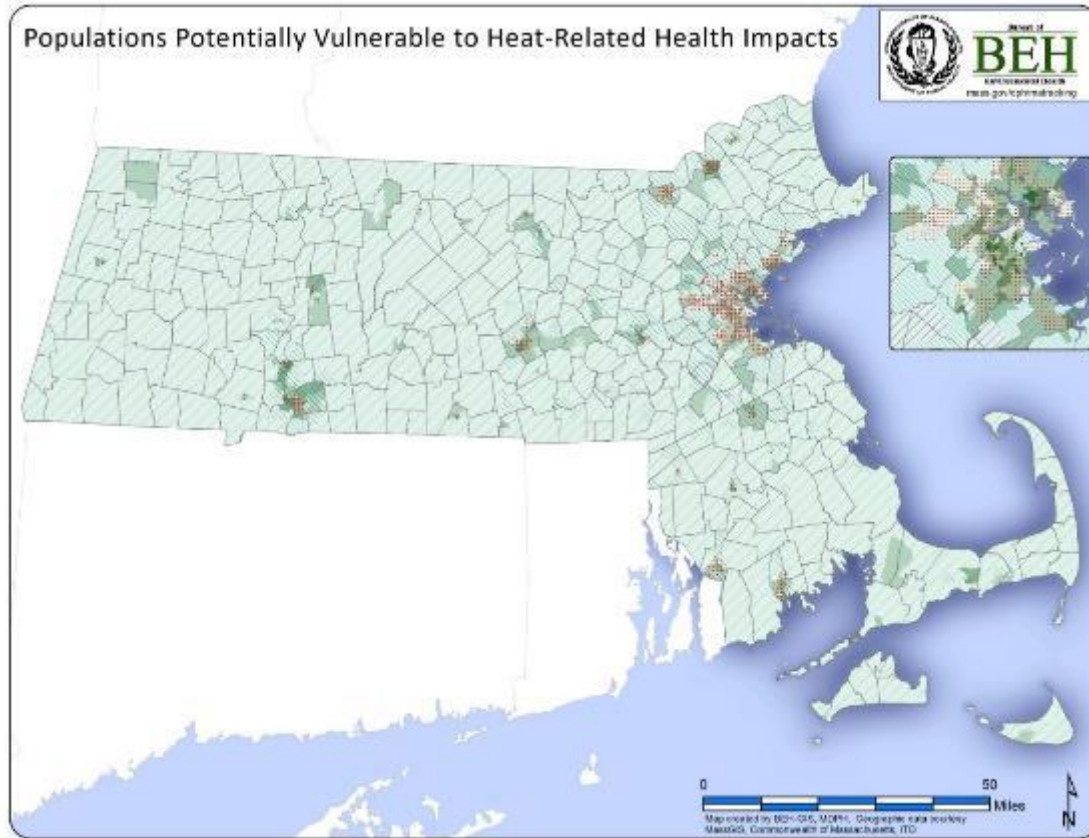
Prevalence Rate per 1,000

Rate per 1,000

- [8.10 - 21]
-] 21 - 27.30]
-] 27.30 - 32.90]
-] 32.90 - 44.30]
-] 44.30 - 75.10]
- Not Shown
- Not Calculated



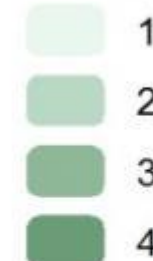
Combining Data on Health, Climate Events, and Health Indicators to Inform Preparedness Efforts



Communities with the most vulnerable populations to climate events are not just those closest to the coast

Population Vulnerability Measures in this map are Low Income, Low English Proficiency, Non-white Race, and Elderly Age

1 - Total Number of Population Vulnerability Measures in each Census Tract (2010)



2 - Population Density (per Square Mile)



Massachusetts Health in Policy Tracking Data Utilization Examples

- **Tracking has expanded breadth and availability of data**
 - Health and environmental data now available to stakeholders
- **Tracking data used to inform health policies**
- **Environmental Policies that use Tracking data**
 - Health Impact Assessments
 - Environmental Justice Population Definitions
- **Community Health Policies that use Tracking data**
 - Community Health Needs Assessments

Health Impact Assessments in Massachusetts

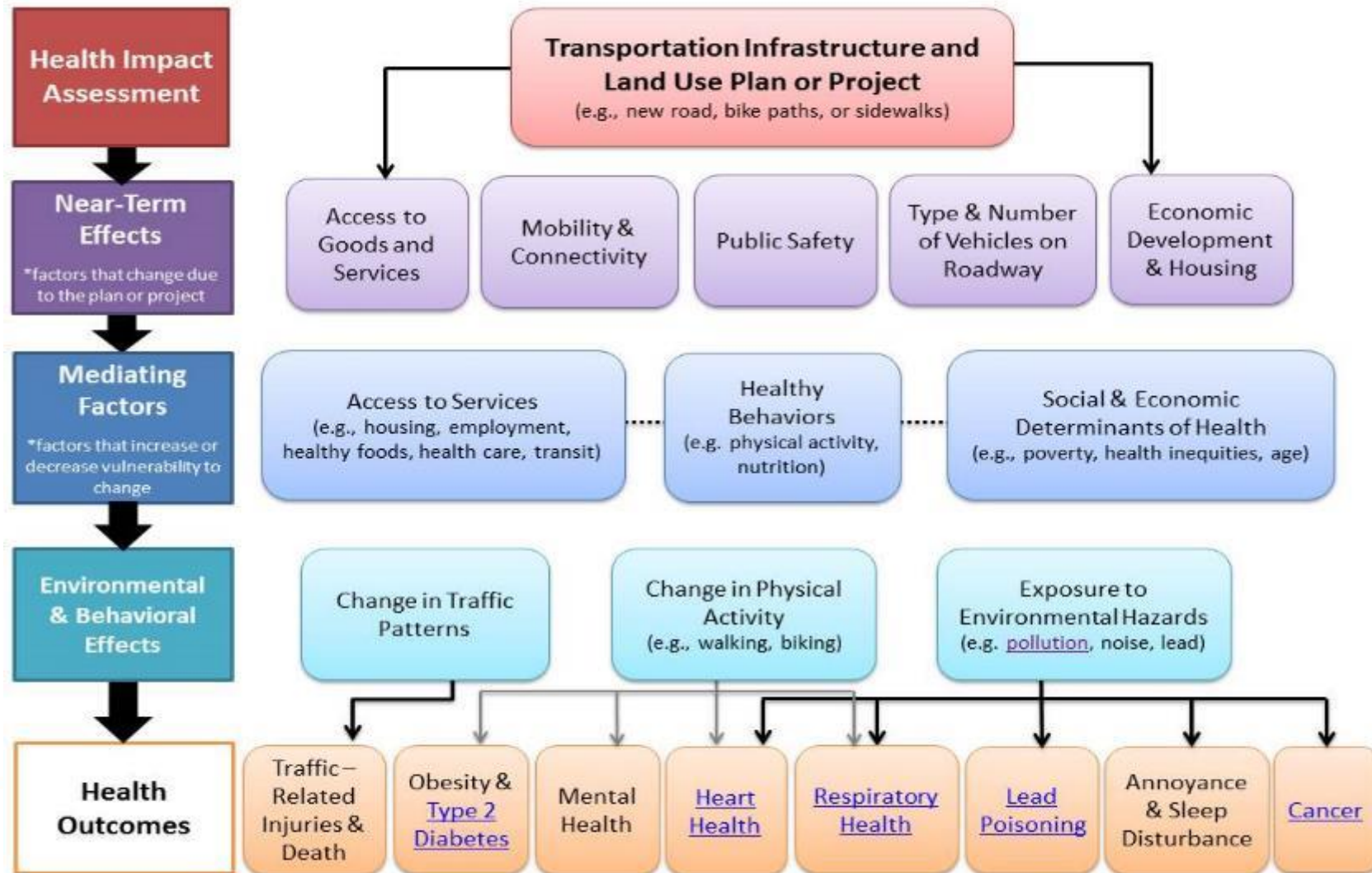
➤ **Healthy Transportation Compact (HTC)**

“Under Massachusetts General Laws Chapter 6C, Section 33, the 2009 Healthy Transportation Compact, is directed to:

- establish methods to implement the use of health impact assessments (HIAs) to determine the effect of transportation projects on public health and vulnerable populations; and
- institute a health impact assessment for use by planners, transportation administrators, public health administrators and developers.”

➤ **Requires inclusion of health considerations and impact assessments in transportation projects**

Healthy Transportation Compact Health Impact Assessment for Inserting Health into Environmental Policy



Health Driving Policy

“McGrath Grounding” HIA

“Previous”



“Proposed”



Reduces noise and promotes physical activity

Health Impact Assessments (HIA) Using Tracking in Massachusetts

HIA integrated
into policy

Opportunity

to leverage Tracking Data
to improve public health

HIA Toolkit on
Portal

Increase awareness

to tracking by offering
guidance on HIA
implementation and
highlighting EPHT Resource

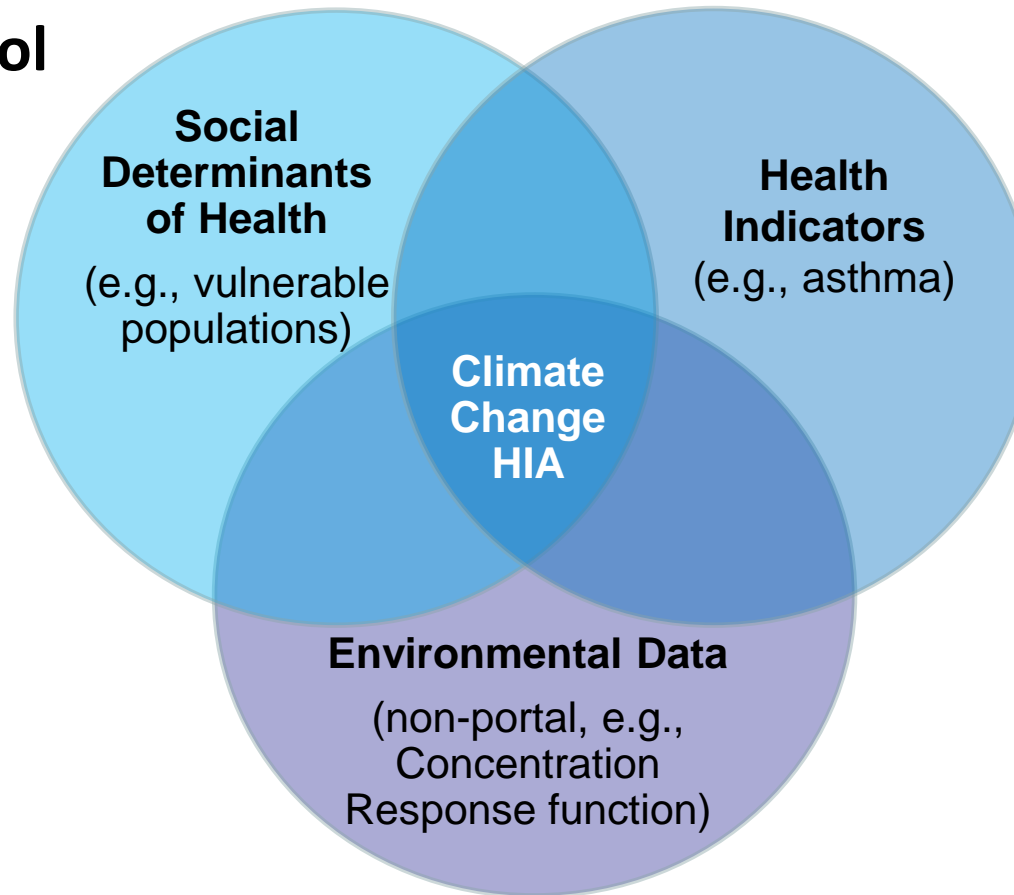
HIA Data Tool

Expedite data access

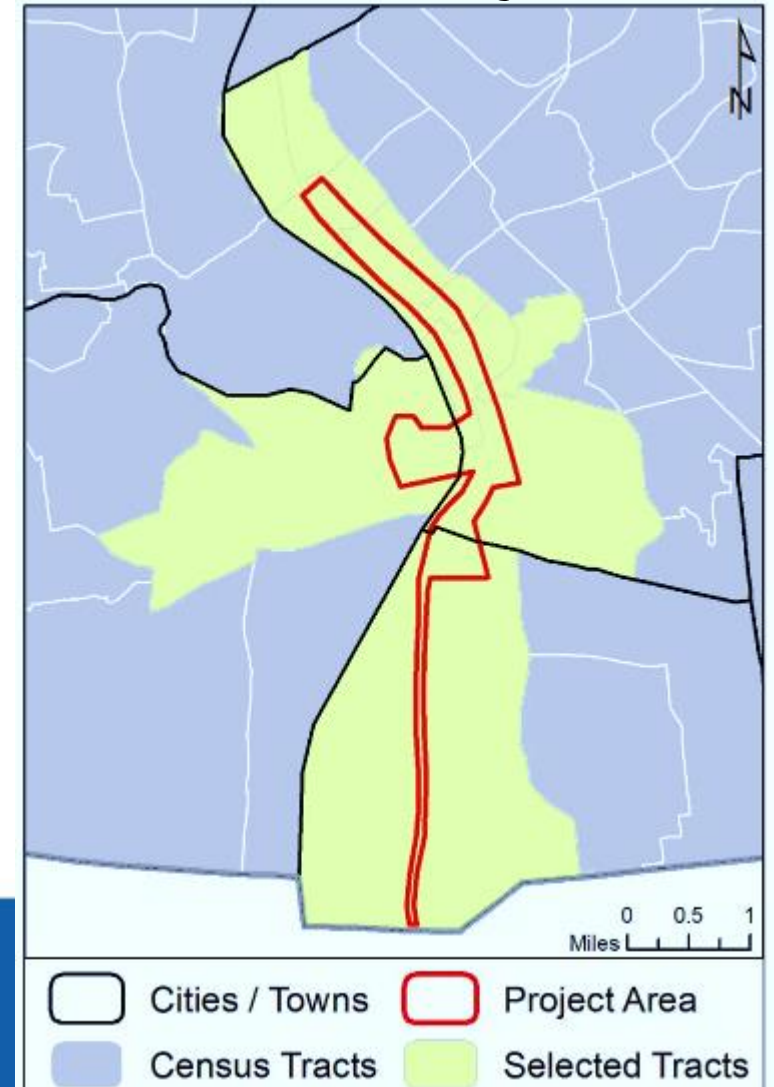
into centralized system
for many types of
Impact Assessments

Health Impact Assessment (HIA) Tool for Data Extraction

- Development of tool to extract health, SDOH and environmental indicators by use type
- Extract aggregate data for custom geography of interest



RT I-91 HIA Project Area



The Inclusion of Health Outcomes in Environmental Justice (EJ) Policy to Give Residents a Voice in Environmental Decision-making

➤ **Review of Environmental Justice (EJ) Policy**

- Urged by stakeholders, including Department of Public Health (DPH) to include health in EJ policy

➤ **DPH concerned that a definition adding health was not consistent with the intent of EJ**

- Might favor ill populations over minority and poor populations

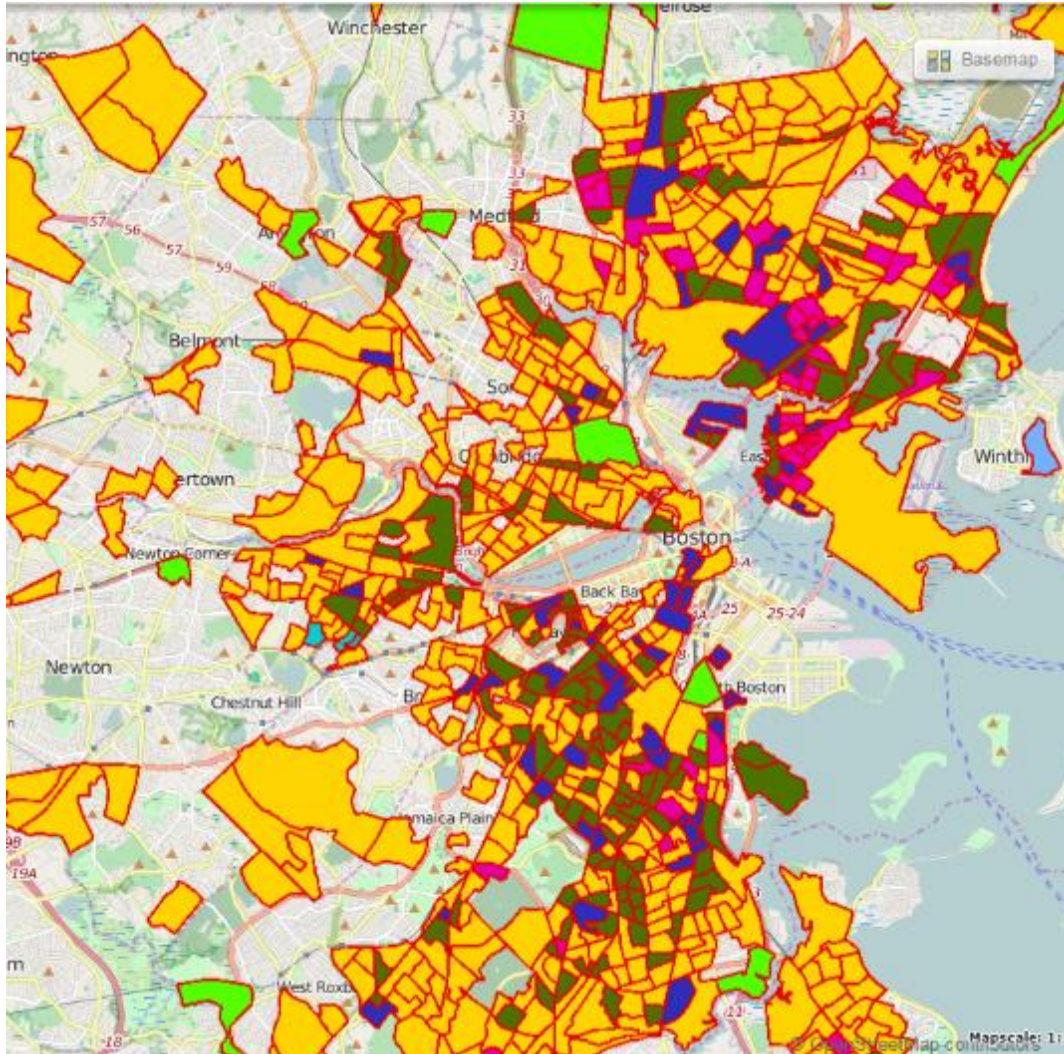
➤ **DPH proposed two stage EJ policy**

- Use health data to identify and prioritize EJ populations as **vulnerable** EJ populations
- Tracking data will be used for this

Environmental Justice

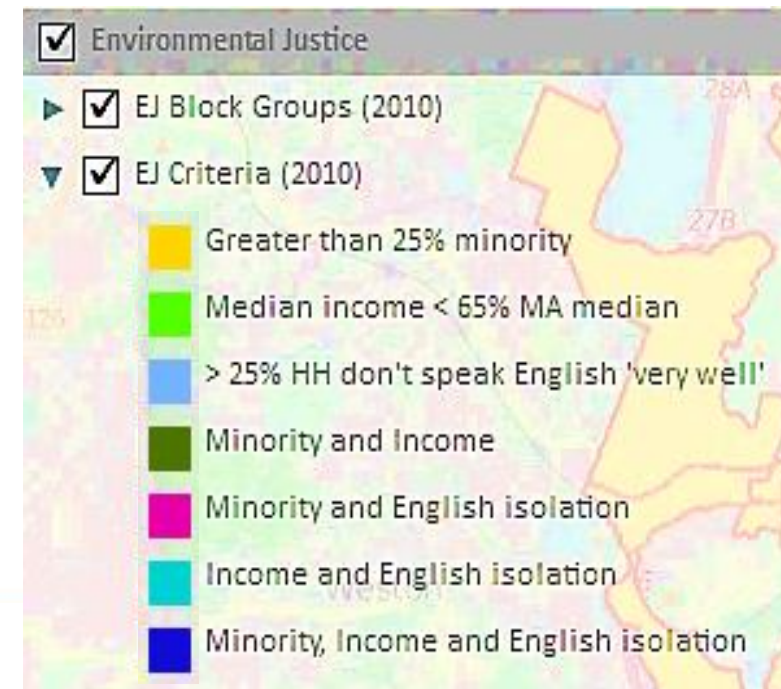
The fair treatment and meaningful involvement of all people regardless of race, national origin, color, or income when developing, implementing, and enforcing environmental laws, regulations, and policies.

2010 Environmental Justice Populations in Metro-Boston



Environmental Justice criteria include:

- Income
- Minority Population
- English Isolation



Using Health Data to Identify Vulnerable Environmental Justice (EJ) Populations

➤ Three key provisions offered by DPH

- Identify EJ populations with higher than average rates of environmentally related health outcomes, including
 - ❑ Childhood asthma
 - ❑ Low birth weight
 - ❑ Childhood lead poisoning
 - ❑ Heart disease
- A rate greater than 110% of the state rate would be sufficient to characterize a population as having vulnerable health
- Specific Massachusetts Tracking criteria would be used

Potential Benefits by Including Health in Environmental Justice (EJ) Policy

➤ Enhance public participation

- Enhance reviews of Massachusetts Environmental Policy Act projects in EJ populations
 - An Act designed to avoid damage to the environment from environmental projects
- Increase participation in environmental agency programs

➤ Improve regulatory compliance, enforcement, and technical assistance

➤ Promote

- Brownfields revitalization and environmental restoration
- Economic partnerships for projects incorporating cleaner production processes in EJ populations
- Open space

Tracking Data Used to Inform Community Health Needs Assessments

➤ Tracking Data Utilization as a Community Health Policy Driver

- As with environmental policies, the lack of readily accessible and interpretable data could lead to uninformed decisions and unclear targets for limited resources
- Data used for Community Health Needs Assessments




Community Health Needs Assessments (CHNAs)

- CHNAs are required by all tax-exempt hospitals every three years
- Hospitals are required to consult with state and local health departments in developing CHNAs and intervention strategies
- Opportunity for public health and Tracking to help guide community health improvement and health equity
- Tracking can provide hospitals with much of the data that hospitals need to identify community health needs
- Tracking data can assist in implementation and evaluation of strategies to improve community health

Community Health Needs Assessments Initial Query Box to Select Hospital and Geography of Interest

Mass.gov [State Offices & Courts](#) [State A-Z Topics](#) [State Forms](#)

 The Official Website of the Executive Office of Health and Human Services (EOHHS)
Health and Human Services
[Departments & Divisions](#)

[A-Z Topic Index](#) [Healthcare & Insurance](#) [Consumer](#) [Licensing](#) [Provider](#) [Researcher](#) [Government Agencies](#)

Community Health Needs Assessment Data

Select Report Type

* ➔

- ☐ Manually select individual communities
- ☐ Pre-defined Hospital Service Area
- ☐ 20 Communities with highest utilization
- ☐ Communities that make up 75% of utilization

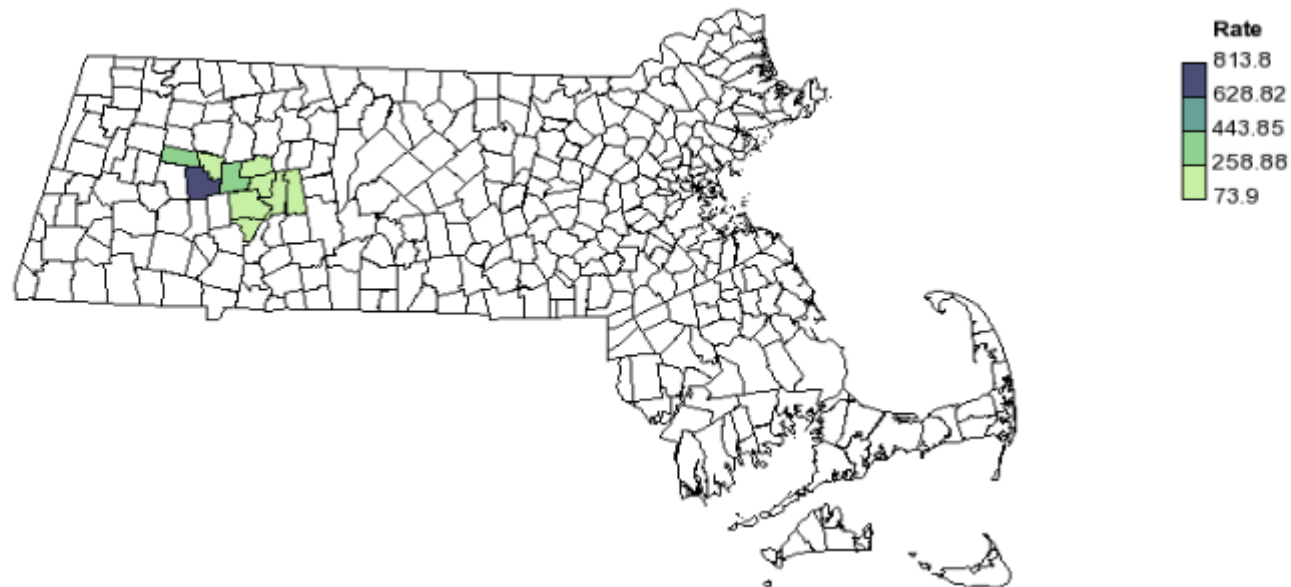
Select Geography


* ➔

- ☐ Abington
- ☐ Acton
- ☐ Acushnet
- ☐ Adams
- ☐ Agawam
- ☐ Alford
- ☐ Amesbury
- ☐ Amherst

[Select all](#) [Deselect all](#)

Community Health Needs Assessment Output for Lead Poisoning



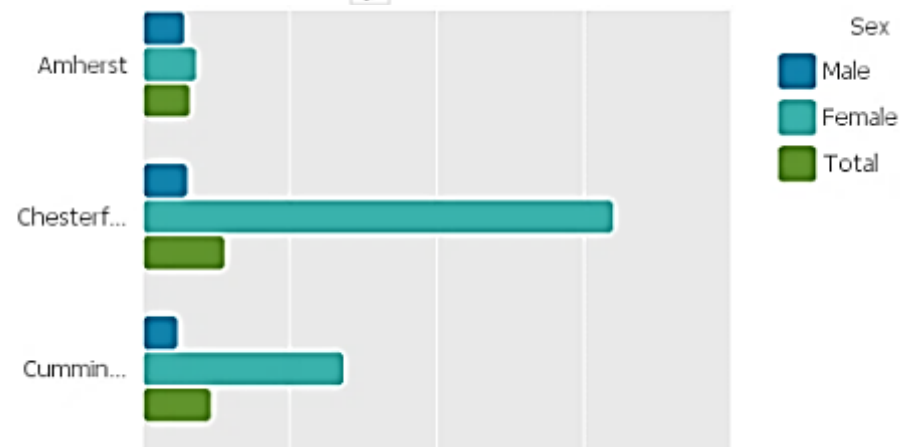
Click the map icon to view the interactive map 

Clinical Care

Childhood Lead Poisoning

Percent Screened for Lead

Year	Community	Sex	Age Group	Case Count	Percent Screened - Rate per 100
2014	Amherst	Male	9 to 47 Months	167	57.20
2014	Amherst	Female	9 to 47 Months	161	74.00
2014	Amherst	Total	9 to 47 Months	328	64.40



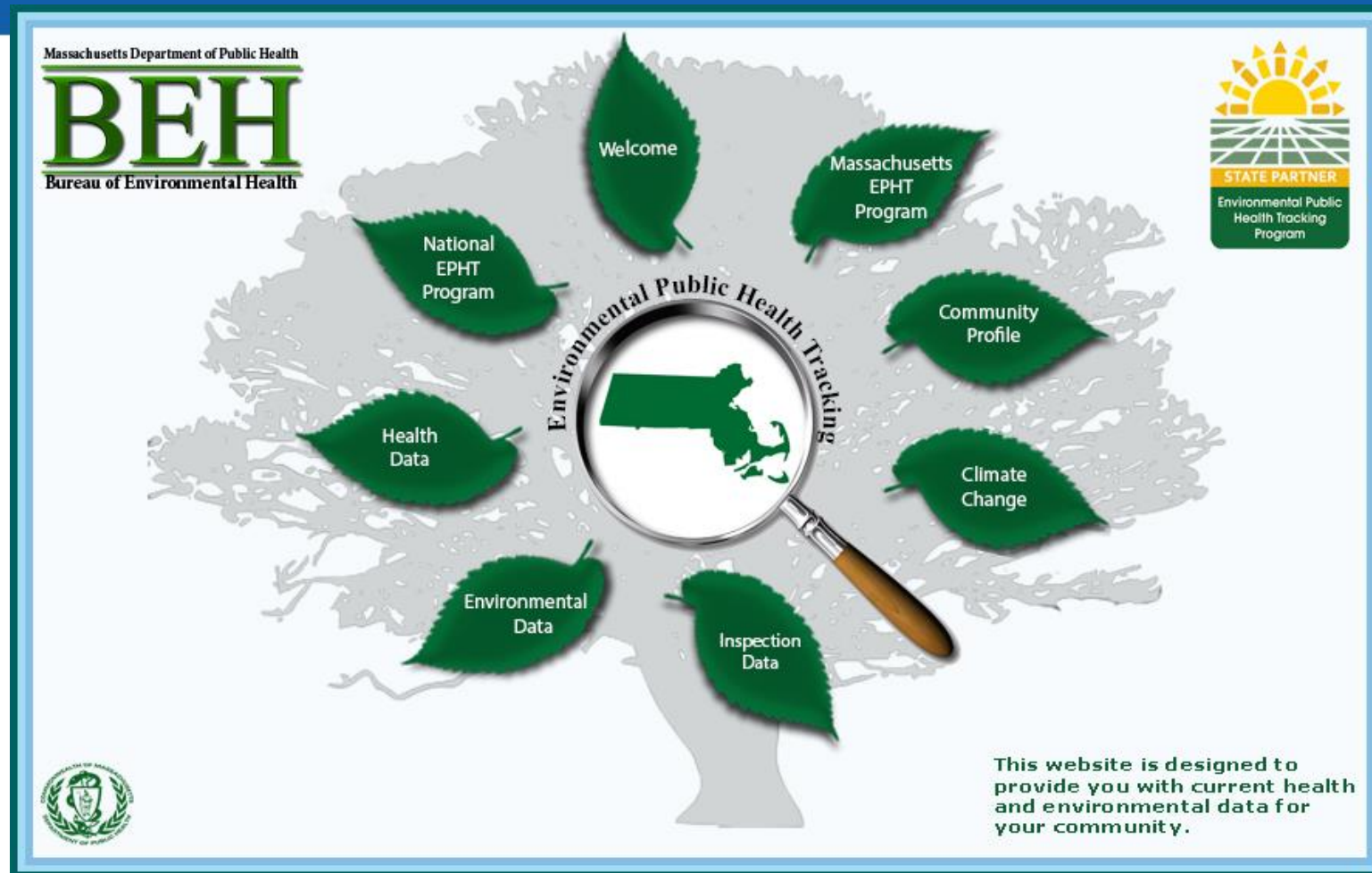
Where Is Massachusetts Tracking Heading?

➤ **On the drawing board ...**

- Developing predictive measures of health care costs associated with hypothesized changes in disease rates
- Inclusion of Tracking data in Primary Cancer Prevention 5-year Strategic Plan objectives
- Application of predictive modeling to target vulnerable populations
- Employing the Tracking infrastructure to help meet DPH formal Population Health goals

➤ **All because environmental health data is now accessible through Tracking**

We're only touching the surface of Tracking's potential!



<http://www.mass.gov/dph/matracking>



Environmental Public Health Tracking

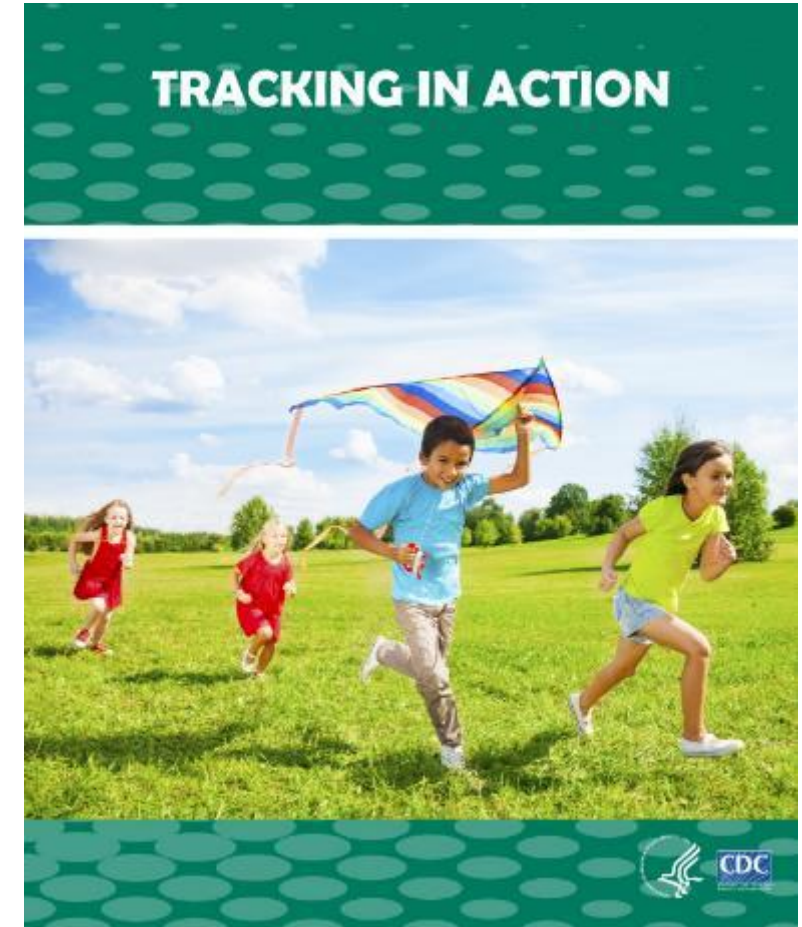
- More and more health and environmental data are available
- CDC's Tracking Network sets standards and describes patterns and trends across the US
- State and city tracking programs and networks address local environmental health concerns

AIR QUALITY
ASTHMA
BIOMONITORING
BIRTH DEFECTS
CANCER
CARBON MONOXIDE POISONING
CHILDHOOD LEAD POISONING
CLIMATE CHANGE
COMMUNITY DESIGN
COMMUNITY WATER
DEVELOPMENTAL DISABILITIES
HEART DISEASE
HEAT STRESS ILLNESS
LIFESTYLE RISK FACTORS
PESTICIDE EXPOSURES
POPULATION CHARACTERISTICS
REPRODUCTIVE & BIRTH OUTCOMES
TOXIC SUBSTANCE RELEASES & MORE



Tracking Experts Fill the Gaps!

- **Data are increasingly integrated into environmental and community health policy and decision-making**
- **Tracking data and expertise fills the gap between the environment and our health**



CDC PUBLIC HEALTH GRAND ROUNDS

Tracking Environmental Health Data for Public Health Decision Making



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